REPORT

1959-60

MINISTRY OF TRANSPORT & COMMUNICATIONS
(Department of Communications and Civil Aviation)

REPORT

OF THE

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INTRODUCTION

The Departments of Communications and Civil Aviation in the Ministry of Transport and Communications are responsible for the administration of:—

(i) Wireless Planning & Co-ordination;

(ii) Posts and Telegraphs;

(iii) Civil Aviation;

(iv) Meteorology;

(v) Overseas Communications;

(vi) Railway Inspection;

(vii) Indian Telephone Industries Limited.

These subjects are administered through the undermentioned organisations, the Heads of which are indicated against each:—

(i) Wireless Planning and Coordination Organisation (Adviser, Wireless Planning and Coordination);

(ii) Posts and Telegraphs Department (Director General, Posts and Telegraphs);

(iii) Civil Aviation Department (Director General of Civil Aviation);

Air Transport Industry (Indian Airlines and Air India International Corporations);

(iv) India Meteorological Department (Director General of Observatories);

(v) Overseas Communications Service (Director General, Overseas Communications Service);

(vi) Railway Inspectorate (Chief Government Inspector of Railways);

(vii) Indian Telephone Industries Limited (Managing Director, Indian Telephone Industries Limited).

2. A report on the administration and activities of the Posts and Telegraphs Department is contained in a separate brochure; this report deals with the activities of the other services and organisations in the Departments of Communications and Civil Aviation.

SECTION I—WIRELESS PLANNING & CO-ORDINATION

Frequency Management

3. During the year, the International Frequency Registration Board prepared draft plans for high frequency broadcasting. These plans were examined for their suitability in preparation for the finalisation of such plans at the Ordinary Administrative Radio Conference. However, the Conference decided to adopt a frequency management procedure for world-wide broadcasting in the high frequency bands.

4. As a result of the deliberations of an Advisory Committee, constituted for the purpose, a number of proposals concerning frequency allocations were made to the Ordinary Administrative Radio Conference, Geneva, 1959. Most of the proposals in respect of frequency allocations to the various services were accepted by the Conference.

5. During the year, 162 frequency usages were authorised after necessary co-ordination with the Indian users and with the International Frequency Registration Board. 404 notifications were sent to the International Frequency Registration Board for securing registrations to Indian Wireless services. Necessary action was taken in respect of over 210 cases of harmful interference, reported by Indian Wireless users.

International Telecommunication Union and International Conferences.

6. This Ministry took an active part at international level in the activities of the International Telecommunication Union (ITU). Various matters pertaining to international commitments on wireless were negotiated with the International Telecommunication Union for and on behalf of the administration of India, after co-ordinating with all concerned Government departments and organisations.

7. India, as a member of the International Telecommunication Union, participated during 1959-60 in the following International Telecommunication Union Conferences:—

(i) *IXth Plenary Assembly of the International Radio Consultative Committee (CCIR)*:

The International Radio Consultative Committee (CCIR) held its IXth Plenary Assembly in Los Angeles, USA, from the 1st April, 1959, to the 29th April, 1959. A delegation consisting of 5 members represented India in the CCIR Assembly. The function of the CCIR

is to study technical radio questions and operating questions, the solution of which depends principally on considerations of a technical radio character and to issue recommendations on them. The IXth Plenary Assembly adopted a number of recommendations, resolutions, study programmes, questions and reports covering the various aspects of the international radio.

(ii) *Administrative Council—XIVth Session*:

India as one of the 18 elected members of the Administrative Council of the ITU, took part in the XIVth Session of the Administrative Council. The Adviser, Wireless Planning and Coordination Branch of this Ministry attended the Session.

(iii) *Joint ECAFE-ITU Expert Committee Meeting at Tokyo*:

India was represented by a two-member delegation at the joint ECAFE-ITU Expert Committee Meeting, which was held at Tokyo during May 1959 to consider the report on the study of regional and national telecommunication requirements in the ECAFE region by two experts provided by the ITU under the United Nations Technical Assistance Administration, for carrying out the first part of the joint ECAFE-ITU project for the development of regional and national telecommunication.

(iv) *Administrative Radio Conference of I.T.U., Geneva* 1959:

The Administrative Radio Conference of ITU met in Geneva for a period of more than 4 months from the 17th August to the 21st December, 1959. A delegation consisting of 5 members represented India in the Administrative Conference. The Adviser, Wireless Planning and Co-ordination Branch of this Ministry, who was the Leader of the Indian Delegation to the Radio Conference, was elected Vice-Chairman of the Conference. The Indian Delegation took a very active and effective part in the work of the Conference. Some of the members of the Delegation were elected as Chairman of various Sub-committees and Sub-working groups. A large number of proposals was made by India, majority of which was adopted at the Conference. The Conference revised the existing Radio Regulations, Atlantic City 1947, reviewed the activities of the International Frequency Registration Board and elected the Board's members. The new Radio Regulations adopted by the Administrative Radio Conference will come into force generally from 1st May, 1961, excepting for the maritime mobile and the broadcasting frequency management procedures which will come into force earlier.

(v) *Plenipotentiary Conference of the ITU, Geneva* 1959:

The Plenipotentiary Conference of the ITU met in Geneva for 2 months from the 14th October, 1959. India was represented by

a delegation of 4 members. Shri M. M. Philip, I.C.S., Secretary, Ministry of Transport and Communications (Departments of Communication and Civil Aviation) was the Leader of the Delegation. The Conference revised the International Telecommunication Convention, Buenos Aires, 1952, considered the report by the Administrative Council of the Union and established the budget of the Union upto 1965. The Indian Delegation took an effective part in the Conference. The structure of the Union and its functions were modified and expanded. Technical assistance to new or developing countries of the Union including administration of Technical Assistance, was greatly emphasised as one of the duties of the Union and its permanent organs. Complete assimilation of U.N. Common System of pay scales was adopted for the Union personnel. It was resolved to take all steps for improving geographical distribution of Union staff. This Conference drew up for the first time the consolidated budget of the Union. The number of seats in the Administrative Council of the Union was raised from 18 to 25 at this Conference. India, which was already a member of the Administrative Council of the Union, was re-elected as a new member of the Council from the region Asia and Australasia. The Conference also elected Dr. M. B. Sarwate, Adviser, Wireless Planning and Coordination Branch of this Ministry as the Deputy Secretary-General of the Union for which post he was sponsored by the Government. The new International Telecommunication Convention adopted by the Plenipotentiary Conference will come into force from the 1st January, 1961.

(vi) *Administrative Council—XVth and XVIth Session*:

India took part in the XVth and XVIth Sessions of the Administrative Council which were held for short periods during the Administrative Radio Conference and Plenipotentiary Conference, 1959 to consider a few urgent matters.

Expanded Technical Assistance Programme of the ITU.

8. This Ministry extended active co-operation on behalf of the Indian Administration to the Expanded Technical Assistance Programme administered by International Telecommunication Union under the United National Technical Assistance Board for developing telecommunications in underdeveloped countries. One Indian expert was provided by the ITU in 1958 in connection with the joint ECAFE —ITU project for the study of regional and national telecommunication requirements in the ECAFE region. The same Indian expert has been re-employed by the ITU for the second term for further execution of the project.

Second Plenary Assembly of the International Telegraph and Telephone Consultative Committee.

9. At the invitation of the Government of India, the Second Plenary Assembly of the International Telegraph and Telephone Consultative Committee of ITU will be held at New Delhi during November-December, 1960. The preliminary work in connection with the organisation of the conference has commenced.

Progress of Monitoring Organisation for the year 1959.

10. Category A Monitoring Station called the International Monitoring Station Delhi has since been commissioned in full bloom and was formally inaugurated by the Minister for Transport and Communications on the 19th December, 1959. The Station is functioning round the clock with operational staff on the watch duties, scanning the radio-spectrum, looking for vacant channels locating interfering and defaulting channels, measuring radio noise and sounding the Ionosphere with the installation of the Ionosphere recorder. With the installation of two Automatic radio noise recorder, the station is in a position to collect data on the atmospheric radio noise obtaining in Delhi and participate in the world-wide programme recommended by the International Radio Consultative Committee.

11. Category B Monitoring Station now functioning in its temporary premises at the Remote Receiving centre of the Civil Aviation Department at Nagpur will shortly be shifted to its permanent building which is now being constructed. Most of the equipment for the Station has already been procured and will be installed at the new site.

12. Of the four category 'C' Monitoring Stations at Bombay, Calcutta, Madras and Shillong, the buildings at Bombay are expected to be ready by April, 1960 and the Station commissioned by August, 1960. The Building work at Calcutta may commence in about 2 months time and the commissioning of the station is expected by the end of 1960. Approval has since been given for the acquisition of site at Madras and a site for the sixth monitoring station at Shillong is being selected with the assistance of the Assam Government. These last two stations are expected to take about 15 to 18 months before they are commissioned.

Licensing.

13. This Ministry, as the Central licensing and regulating authority in wireless matters renewed 3247 existing licence issued to establish, maintain and operate wireless stations in the fixed and

mobile services and issued 378 New Licences during the year under review as detailed below:—

Sl. No.	Type of Licence	Number renewed for 1959	New Licences issued in 1959
1	Aircraft	209	2
2	Amateurs	198	4
3	Maritime	161	15
4	Police network	2003	206
5	Railway	405	11
6	Demonstration	..	20
7	Experimental	109	6
8	Fixed Land Stations and Land Mobile Stations	162	69
9	Import (without annexures)	...	45
		3247	378

14. The year under review showed a continued increase in interest in operational necessity of wireless Communication by various Deptts. and Organisations. There has been a marked increase in respect of fixed land stations and land mobile stations.

15. A coordinated plan for meeting the needs of rapid dissemination of flood control data has been put into practice for the flood season of 1959 and its results would be watched till the end of the current year.

16. Requirement of very special type of communication facility by important public, industrial concerns like steel projects, Lignite Corporation, Electric power Generation and Supply undertakings continued to show a marked demand for VHF mobile usage to meet the pressing operational necessities of the industries.

17. Indian Wireless Telegraphy (Amateur Service) Rules 1958 have come into force.

18. Examinations for the award of Certificates of Proficiency for Wireless Operators are held twice a year under the Indian Wireless Telegraphy Rules, 1954. There are five categories of C.O.P.'s (full form) and candidates for I and II class COP's can pass full examination by passing in Part I and Part II. During 1959 regular examinations were held from March, 1959 to May, 1959 at Calcutta, Cuttack, Bombay, Poona and Rajkot and from September, 1959 to November, 1959 at Poona, Bombay, Calcutta and Meerut. 863 candidates appeared. During the year 3 Special Examinations were also conducted two at Allahabad and one at Bombay for which 103 candidates appeared.

19. In all out of 966 candidates 251 passed the examinations.

20. 276 new certificates and personnel licences were issued and 24 old Certificates of Competency issued by this Ministry and by Foreign

Governments were renewed under the Indian Wireless Telegraphy Rules, 1954.

Budgetary Position.

21. The budget estimates under Demand No. 94 in respect of:

(i) Monitoring Organisation, and

(ii) Contribution to the International Telecommunication Union, Geneva, are tabulated below:

Particulars	B.E. 1959-60	R.E. 1959-60	B.E. 1960-61
	Rs.	Rs.	Rs.
(*a*) Monitoring Organisation	5,77,400	4,45,600	5,41,900
(*b*) Contribution to the International Telecommunication Union.	4,38,000	5,47,500	3,67,000

SECTION II—RADIO AND CABLE BOARD

22. The Radio and Cable Board was constituted by the Government of India in 1953 as a high level inter-ministerial technical body to coordinate all the telecommunication activities in the country. Before its establishment the Inter-departmental Wireless Board in the Posts and Telegraphs Department was coordinating the requirements of wireless developments of the various user departments in the country. As the Inter-departmental Wireless Board, with its limited functions, was not in a position to coordinate the growing needs of the user departments in respect of wireless, landlines, radio, navigational aids and production of telecommunication equipment, it was decided by the Cabinet that the Radio and Cable Board with the technical representatives of the telecommunication user Ministries be formed The Board's decisions are required to be unanimous and are binding on the user Ministries Departments.

Functions:

23 The functions of the Board are broadly as follows:—

(a) to review the adequacy of both external and internal radio, cable and other communication systems;

(b) to ensure maximum and efficient utilization of the various communication systems; and

(c) to coordinate the research, development, production and provision of equipment for radio, cable and other communication systems.

Composition.

24. The Board is composed of the technical representatives of the Ministries of Defence, Home Affairs, Information and Broadcasting, Railways, Transport and Communications (Department of Transport and Deptts. of Communications and Civil Aviation) and Scientific Research and Cultural Affairs. The Chairmen of the Committees of the Board are also members of the Board. The technical representative of the Ministry of Transport and Communications (Deptts. of Communications and Civil Aviation) is the Chairman of the Board.

Committees.

25. There are four Standing Committees working under the Board at the headquarters, viz., Research and Production Committee, Radio Committee, Traffic Procedure and Codes Committee, and Lines

Committee, which advise the Board on technical aspects of the telecommunication problems. The composition of these Committees is determined by the Board. All the major user departments are represented on these Committees.

Regional Committees.

26. There are six Regional Committees working under the Board at Delhi, Lucknow, Calcutta, Bombay, Nagpur and Madras, which examine the telecommunication problems of local nature arising in their respective areas. The regional bodies of all the major user departments are represented on these Committees.

Subjects dealt with by the Board.

27. Nine meetings of the Board and 26 meetings of its Committees were held during the period under review. The Board and its Committees dealt with several important telecommunication problems during this period; the more important ones are given below:—

(i) coordination of the requirements and rationalisation and standardisation of the detailed technical specifications of various wireless and electronic equipments and its components.

(ii) standardisation of a Hindi Morse Code for use in the country

(iii) compilation of a directory of the telecommunication equipment manufactured in India.

(iv) procedures for carrying out tests and field trials of the wireless equipment manufactured by the B.E. Ltd.

(v) review of the procedure for the clearance of indents for wireless and electronic equipment.

(vi) evolving of a netting procedure for minimising passive transmission time for use on wireless telegraph, radio telephone and radio tele-type services.

(vii) study of existing techniques for single-side band transmission and reception for recommending suitable methods for its adoption in India.

(viii) evolving of a common phonetic code for Hindi Alphabet for use on the telephone and radio telephone services in the country.

(ix) review of the adequacy of land-line communications in the North Western and Eastern region of the Indian Union.

(x) examination of matters relating to India's proposals to the Administrative Radio Conference (August 1959—Geneva).

(xi) siting of transmitting and receiving stations of the various user departments in the country.

SECTION III—CIVIL AVIATION

28. An overall increase in the number of miles logged, Passengers flown and mails carried by the Air India International and the Indian Airlines Corporation on their scheduled services marks the progress of Civil Aviation during the year 1959.

29. The Indian Airlines Corporation introduced a new service on the route Delhi-Chandigarh-Kulu. The newly constructed aerodrome at Kandla was opened to traffic. New Flying Clubs were inaugurated at Trivandrum and Baroda. The "Ashvini" a two-seater training glider designed and constructed by the Technical Centre of the Civil Aviation Department was type-certificated. India was represented at the Twelfth Session of the Assembly of the International Civil Aviation Organisation held at San Diego, U.S.A. and was re-elected to the Council of the I.C.A.O. A bilateral Air Services Agreement between the Government of India and the Government of Italy which was initialled in New Delhi on the 2nd August, 1958 was signed in Rome on 16th July, 1959. The services of two officers of the Civil Aviation Department were placed at the disposal of the International Civil Aviation Organisation for appointment in Indonesia and Afghanistan under the I.C.A.O. Technical Assistance Mission. The services of one officer were placed at the disposal of the Government of Ghana. The various developments during the year are dealt with in detail in the succeeding paragraphs:—

Air Corporations.

30. When the Air Corporations were set up in August 1953 it had been decided that no interest should be charged from the two Air Corporations in respect of Government investments for a period of five years commencing from 1st August, 1953. The position was reviewed and it has been decided that both in respect of the Air India International and the Indian Airlines Corporation, the total Capital advanced by Government should be treated as if half of it were Equity Capital and the other half as Debenture. The rate of interest on the Debenture portion of the Capital will be 4½%.

It has also been decided to waive payment of interest on the debenture portion of the Capital upto 1-10-1966 in respect of both the Corporations.

Air India International Corporation.

31. *Fleet.*—The three Boeing 707 Jet aircraft on order are due to be delivered in the first quarter of 1960. The Corporation have, with

the approval of the Central Government placed an order for a fourth Boeing 707 Jet aircraft in January, 1960 at a cost of Rs. 4 crores including spares, engines and ancillary equipment The fourth aircraft is expected to be delivered in April, 1961.

The Air India International Corporation lost one of their Super-Constellation aircraft in July 1959, as a result of an accident while landing at Santacruz airport, thus reducing the fleet to 9 Super-Constellations

32 *Operations.*—At the end of 1958-59 the routes and the frequencies which were all operated with Super-Constellation 1049 were as follows:—

(*i*) Bombay/London	Daily
(*ii*) Bombay Nairobi	Twice a week
(*iii*) Bombay/Tokyo	Thrice a week
(*iv*) Bombay/Sydney	Once a week
(*v*) Bombay/Jakarta	Once a week
(*vi*) Delhi Moscow	Once a week

During the year 1959-60 also the same scale of operation continued.

(ii) The total revenue hours flown during 1958-59 were 27,924 representing an increase of 6·2% over those of the previous year. During 1959-60, it is estimated that a total revenue operation of about 29,910 hours is likely to be achieved.

33. *Boeing 707 Jet Training.*—Preliminary to the Corporation introducing the Boeing 707 Jet aircraft operations from the financial year 1960-61, flight crew, ground instructor, maintenance and other personnel were sent for training on crew system familiarisation and Conway engines etc. at the Boeing Airplane Company in Seattle, Rolls Royce, Derby and Curtiss-Wright Works in New York. Similar training, including lectures and courses in flight despatch and performance, was arranged for both flight crew and ground personnel in Bombay with Boeing instructors.

34. *Engineering School.*—The Corporation's Engineering school at Bombay conducted 14 different courses for 332 employees who took advantage of these courses

(ii) *Training within Industry.*—One of the Instructors attended the Training within Industry course at the T.W.I. Centre and qualified as a T.W.I. Training Officer. Subsequently, 3 courses in Job instructions, Job methods and Job relations were conducted and 18 employees attended the course. The School will be developing the T.W.I. Supervisor training course and it is expected that in time to come this programme will cover all Supervisory personnel.

35. *Central Administrative Building.*—The Air India International has on hand a project to construct a Central Administrative Building in Bombay. The Building which is proposed to be erected on a plot of land taken from the Government of Bombay on a 99 years lease is now estimated to cost approximately Rs. 70/- lakhs. The construction work is expected to commence early in 1960.

36. *Labour Relations Committee.*—The Second Labour Relations Committee which was constituted in July, 1958 for a term of 2 years is still functioning. So far, the Committee has held seven meetings.

37. *Advisory Committee.*—The Advisory Committee for the Air India International Corporation constituted in February, 1958 has so far held seven meetings.

38. *Unions and Associations.*—The management of the Air India International and the Air Corporations Employees Union drew up in April, 1959 a Memorandum of settlement in respect of certain demands put forward by the Union. Under a separate agreement between the Management and the Union the parties agreed to refer certain other demands to a committee of Arbitration, consisting of two representatives of the Management and two representatives of the Union with an independent Chairman of the status of a judge of the High Court nominated by the Government of Bombay. The Arbitration proceedings are in progress.

Indian Airlines Corporation

39. *Cost Structure Committee.*—The Central Government appointed a Committee on the 15th January, 1959 to examine the Cost Structure of the Indian Airlines Corporation. The terms of reference of the Committee were:—

(i) To see whether the Corporation's system of Planning, Operation and Cost Control are as efficient as can be and to recommend what improvements and economies are feasible;

(ii) To determine a formula for working out "Standard Costs" of operation on the basis of which the losses of the Corporation may be subsidised.

The report of the Committee is under consideration of Government in the light of the comments received from the Indian Airlines Corporation.

40. *Fleet.*—On the 1st April, 1959, the Indian Airlines Corporation had an operational fleet of 80 aircraft, but the strength decreas-

ed to 75 aircraft by the 10th January, 1960. The details are given below:—

Fleet Position

	As on 1-4-59	As on 10-1-60
Operational		
Dakota	61	57 }*
Skymaster	6	5 }
Heron	3	3
Viscount	10	10
	80	75
Aircraft in Storage		
Viking	12	12
Heron	4	4
Single Beech	1	1
Avro XIX	1	Nil
TOTAL	18	17

*The reduction in number is due to loss of aircraft as a result of accidents.

(ii) The question of replacement of Dakotas in the fleet of the Indian Airlines Corporation is under the consideration of the Government and the Corporation. In the meanwhile, to meet immediate interim requirements the Government have approved of the proposal of the Corporation to purchase 5 Fokker Friendship, on the basis of a barter deal.

41. *Operations.*—(i) As a result of negotiations with the Punjab Government, a twice weekly service Delhi/Chandigarh/Kulu was operated in October, 1959. The Punjab Government has agreed to bear the losses to the extent of Rs. 1·53 lakhs for 60 return flights. The service will be operated during the summer season. The proposal to extend the Delhi/Jaipur service to Jodhpur and Udaipur is being pursued with the Rajasthan Government.

(ii) The Indian Airlines Corporation introduced certain changes in their route pattern w.e.f. 1st December, 1959, the important features of which are:—

(a) An additional Viscount service has been introduced between Bombay and Delhi with a frequency of four times a week. This service supplements the existing twice daily service on this route.

(b) A new service with a thrice weekly frequency has been introduced on the route Delhi-Gwalior-Bhopal-Indore-Bombay under a Government directive.

(c) An additional Viscount service has been introduced between Calcutta and Bombay with a frequency of three times per week. This service is in addition to the existing daily service on this route.

(d) Skymaster aircraft has been introduced on the Bombay-Bangalore service. This service was previously operated with Dakota type of aircraft.

(e) The frequency of the Bombay-Belgaum-Mangalore-Cochin service has been increased from 5 to 7 times a week.

(f) The route-pattern in the Bombay-Saurashtra area was re-examined with a view to ensuring optimum utilisation of the pay-load offered and reducing losses as far as possible.

(g) The frequency of the Patna-Kathmandu service was also increased from seven to ten times a week with effect from 1st December, 1959.

42. *Engineering.*—A total number of 134 engines were overhauled in the workshops during the period 1st April, 1959 to 31st October, 1959.

(ii) One Viscount aircraft has been fitted with Airborne weather radar equipment. The other aircraft will also be fitted with similar equipment in due course.

(iii) The Corporation is maintaining one Beaver aircraft and one Auster aircraft belonging to the Ministry of Food and Agriculture. A contract has been signed with the Defence Ministry for the overhaul of the I.A.F. Viscounts, their engines, propellers and accessories.

43. *Training Programme.*—To impart training to the existing junior staff and to co-ordinate training activities as well as to arrange refresher courses, strength of A.M.E. Instructors has been augmented by the appointment of four more Instructors at the three Bases. Training Sections are now functioning at Delhi, Calcutta and Hyderabad. Arrangements are also in hand to organise a training section at Bombay.

(ii) In addition to the Engineering Personnel trained abroad on the overhaul and maintenance of Viscount aircraft, Dart Engines and accessories, arrangements were also made to train 25 Engineering personnel from Bombay, Hyderabad, Madras and Calcutta during the period under review, while the Viscounts were undergoing major Inspection Schedules at Delhi Base.

(iii) Engineers who completed their training abroad on Viscounts are in turn delivering lectures to other Engineers and Mechanics on

the overhaul and maintenance of Viscounts, Dart Engines and Accessories. Special course of instructions has been arranged at Delhi for the training of Instrument Engineers on the Maintenance and overhaul of PB—10 Auto-pilot.

(iv) Over 1,000 hours of flying training was carried out at the Central Training Establishment, Hyderabad. In addition, 3,800 hours of Instructional training was given on the Link Trainer and 653 hours on the newly installed Redifon Simulator.

(v) Training facilities available under the Colombo Plan were also availed of.

44. *Traffic.*—There has been a steady increase in traffic and revenue during the period under review.

45. *Stores.*—(i) *Reduction of stocks.*—In view of the fact that the Dakota will gradually begin to be replaced from 1960-61 onwards, lists of Dakotas surplus items held at different Bases have been prepared. These lists are being circulated to H.A.L. and I.A.F., so that they may pick out the items required by them and the remainder will be put up for disposal.

Lists of Skymaster spares surplus to the Corporations five years requirement have also been prepared and circulated to H.A.L. and I.A.F.

(ii) *Disposals*:

(a) *Vikings.*—None of the 12 Vikings could be disposed of.

(b) *Herons.*—One Heron aircraft has been sold to Messrs. Hindustan Steel Ltd. Every effort is being made to dispose of the remaining aircraft.

(c) The following aircraft and spares have also been disposed of:—

Avro Anson aircraft with two spare Engines and spares.

Twin Beech Airframe spares.

46. *Passenger amenities.*—Due to the difficulties involved in serving major meals to the full complement of passengers on Dakota and Heron services, on account of Short Sectors, restricted galleys etc., serving of major meals on Domestic Dakota and Heron services was stopped this year and snacks were introduced in lieu. The quantum of the snacks *i.e.*, light and heavy, have been adjusted in accordance with the flight timings.

On the Viscount and Skymaster services major meals continue to be served at appropriate meal timings.

(ii) Catering Committees have been formed in the Areas, which review periodically the catering and cabin services and suggest suitable measures to improve the service. Suggestions enunciated in one Area are implemented in other Areas also.

(iii) To improve the catering and cabin services the catering staff are being trained at the College of Catering and Institutional Management, Bombay.

47. *Labour Relations Committee.*—As the life of last Labour Relations Committee had expired, a new Labour Relations Committee was elected and the Committee held four meetings in the year under review.

48. *Advisory Committee.*—The Advisory Committee for the Indian Airlines Corporation, constituted by the Central Government had two meetings during the year 1959.

49. *Welfare Activities.*—(i) *Sports.*—The All India I.A.C. Athletic Meet was held at Bombay on the 10th and 11th January, 1959. The Area Sports Club at Bombay, Calcutta, Delhi, Madras, Hyderabad, Nagpur and Bangalore are making good progress. The 3rd All India I.A.C. Athletic Meet will be held in Delhi sometime in the month of March, 1960.

(ii) *Holiday Homes.*—The Corporation has now established a Holiday Home at Matheran near Bombay in addition to Holiday Homes at Mussoori and Shillong. These Holiday Homes are proving a great attraction and in the year under review 83 employees and their families took advantage of them.

(iii) *Welfare Fund.*—An amount of Rs. 3,109·12 nP. was paid ex-gratia by way of financial assistance to 43 employees out of the Reserve Account of Provident Fund.

(iv) *Credit Co-operative Societies.*—The Credit Co-operative Societies functioning in I.A.C. are making satisfactory progress. The progress made by the Employees' Co-operative Bank, Bombay, has been outstanding in particular.

(v) *T. B. Sanatoria.*—The Corporation has reserved beds at the following T. B. Sanatoria:—

(1) Wanless Wadi Sanatorium (Bombay Area) 2 beds.

(2) K. S. Roy Sanatorium (Calcutta Area) 2 beds.

(3) Lady Linlithgow Sanatorium (Delhi Area) 1 bed.

During the year under review 9 employees were admitted and received/are receiving treatment at the above Sanatoria.

(vi) *Housing.*—The Corporation proposes to build 400 quarters under the Subsidised Industrial Housing Scheme at Delhi.

(vii) *Medical facilities.*—Adequate medical facilities have been provided and Medical Officers have been appointed at all stations of the Corporation.

50. *Union Management Consultation and Industrial Relations.*—Meetings were held by the General Manager with the representatives of the Air Corporations Employees' Union, Pilots' Association, the Radio Officers' Association and Engineers' Association. These meetings have helped towards the solution of a number of problems and have also helped in improving industrial relations.

51. *Works Committees.*—The Works Committees are functioning at Bombay, Calcutta, Delhi, Madras, and Hyderabad. The Works Committees at Bombay, Madras, Delhi and Hyderabad have been enlarged so as to include the representatives of the Flying Crew, Engineers' Association, Traffic, Accounts and the Administrative Staff. Necessary steps are being taken to enlarge the Works Committee at Calcutta.

Scheduled Air Transport Services.

52. A list of scheduled air services in operation by the Indian Airlines Corporation and the Air India International on the 1st December, 1959 is given at Appendix I. The comparative figures of air transport operations during 1959 (approximate) and during the past years from 1946 onwards, in so far as scheduled operations are concerned, are given below:—

Years	Hours flown	Miles flown	Passengers carried	Freight carried (lbs.)	Mails carried (lbs.)	Capacity ton/miles offered	Revenue load ton/miles
1946 . .	29,539	4,520,046	105,251	1,885,726	1,026,403	8,536,457	6,391,253
1947 . .	59,312	9,361,673	254,960	5,647,562	1,405,073	18,596,778	14,355,164
1948 . .	78,961	12,648,765	341,186	11,974,736	1,582,645	26,320,058	19,295,532
1949 . .	93,944	15,098,354	357,415	22,499,679	5,031,959	36,538,338	23,249,052
1950 . .	117,422	18,896,139	452,869	80,006,756	8,356,144	52,251,865	34,414,327
1951 . .	118,684	19,497,505	449,462	87,665,229	7,181,611	57,403,065	39,015,149
1952 . .	119,490	19,562,267	434,480	86,037,607	8,376,813	56,733,502	37,456,595
1953 . .	114,796	19,202,388	403,992	84,820,083	8,846,181	56,550,509	37,239,824
1954 . .	117,402	19,798,276	431,595	86,414,906	10,672,725	62,643,760	41,182,548
1955 . .	125,655	21,266,514	468,894	98,199,645	11,478,091	74,868,522	49,203,984
1956 . .	136,813	23,481,137	558,625	96,231,088	12,686,224	92,797,068	60,595,098
1957 . .	134,453	23,496,078	615,321	85,691,035	13,080,614	99,901,374	66,038,500
1958 . .	135,046	24,578,076	696,175	93,639,914	13,608,257	111,887,640	71,924,445
1959 . .	132,600	24,913,000	722,500	73,620,000	14,981,000	120,976,000	74,990,000

Night Airmail Services.

53. During 1959, the Night Airmail Services operated by the Indian Airlines Corporation on the routes Madras-Nagpur-Delhi and Bombay-Nagpur-Calcutta carried approximately 43,429 passengers, 3,235,745 lbs. of cargo and 4,216,906 lbs. of mail, giving a daily average of 119 passengers, 8,865 lbs. of cargo and 11,553 lbs. of mail as against the figures for 1958 of 47,681 passengers, 3,032,224 lbs. of cargo and 4,074,448 lbs. of mail, and the daily averages of 131 passengers, 8,307 lbs. of cargo and 11.163 lbs. of mail.

Non-scheduled Air Transport Services.

54. On 1st December, 1959 in addition to the Air India International and the Indian Airlines Corporation, fourteen subsidised Flying Clubs and seven air transport companies held permits for the operation of non-scheduled services. Besides these, one company held permit for giving joy rides.

55. For the benefit of the tourists intending to visit the historical places at Khajuraho, Indian Airlines Corporation has introduced from 22nd November 1959, once weekly regular non-scheduled service on the route Delhi-Panna.

56. During 1959, approximately 33,000 hours and 5,346,000 miles were flown on non-scheduled operations against the previous year's figures of 30,522 hours and 4,996,868 miles. The number of passengers and the amount of cargo carried were approximately 92,000 passengers and 79,005,000 lbs. of cargo against the previous year's figures of 99,347 passengers and 84,200,844 lbs. of cargo.

N.B. Air Transport statistics for the year 1959 include estimated figures.

Aerodromes.

57. Eighty five aerodromes were controlled and maintained by the Civil Aviation Department at the end of November, 1959, as shown in Appendix II. The newly constructed airport at Kandla was opened on 14th March, 1959 At the end of the year, the construction of the aerodromes at Behala in West Bengal and Raxaul and Jogbani in Bihar was in progress and the construction of the aerodromes at Haldwani in U. P. and Tulihal in Manipur was nearing completion. During the year, three landing grounds at Hirakud in Orissa, Bhilai (Birebhat) in Madhya Pradesh and Doomur Dullong in Assam were licensed for private use.

58. The new terminal building at Rajkot aerodrome was brought into use from 30th April, 1959. The main runway at Keshod aerodrome was opened for operations. The civil aerodrome at Coimbatore (Peelamedu) was opened to air traffic from 1st November, 1959.

Development works for the operation of Boeing Jet aircraft were in progress at Bombay (Santacruz), Calcutta (Dum Dum) and Delhi (Palam) airports. The non-instrument runway at Calcutta (Dum Dum) airport was extended and opened to traffic.

59 In accordance with the recommendations of the Joint Middle East/South-East Asia Regional Air Navigation Meeting of the International Civil Aviation Organisation held at Rome in January/February, 1959, the Flight Information Region boundaries of Bombay, Calcutta, Delhi and Madras were modified from 1st July, 1959.

60. Two meetings of the Airport Consultative Committee were held during the year 1959. Representatives of foreign airlines, Air India International, Indian Airlines Corporation, Kalinga Airlines, Aero Club of India, Air Headquarters, the India Meteorological Department, C.P.W.D. and the Civil Aviation Department attended the meetings. The Assistant Air Adviser to the U. K. High Commission and representatives of Burmah-Shell and Standard Vacuum Oil Company were also present as observers. Various items pertaining to problems of operators regarding Air Traffic Control, Meteorology, Works and Planning at civil aerodromes were discussed at the meetings.

Capital Works.

61. Some of the important capital works completed during the year 1959 include the construction of a sound proof engine test bed at Delhi (Safdarjung) airport; repairs to the East-West runway at Delhi (Palam) airport and the extension of the western end of the East-West runway at Bombay (Santacruz) airport. Among the important new works taken in hand during the year include the construction of the terminal building at Trivandrum aerodrome; construction of an office block at Calcutta (Dum Dum) airport; construction of residential quarters and extension of runway at Gauhati aerodrome; earth work for the construction of a fair weather airstrip at Behala; strengthening of runway at Ahmedabad and strengthening and regrading of the runway at Aurangabad Aerodrome. Work of cutting of Kurla Hills No. 1 and No. 4 at Bombay near the Santacruz airport was also taken in hand during 1959. This work is a part of the main project of extending the East-West runway at Bombay (Santacruz) airport for the operation of Boeing Jet aircraft.

62. The programme for the next year includes improvement of runways, taxi tracks and aprons at Santa Cruz, Palam, Madras, Lucknow, Jaipur, Begumpet and Patna aerodromes, construction of terminal buildings at Agartala, Madura and Cochin and rest-rooms at Nagpur, provision of technical buildings, freight sheds, W.T. Stations, power houses at Madras, Cochin, Madura, Kotah, Ahmedabad and Nagpur, construction of yellow fever hospitals at Madras

and Palam, provision of an engine over-haul workshop at CATC Allahabad and construction of residential quarters at Madras, Dum Dum, Kamalpur, Khowai, Pannagarh, Tezpur, Kotah, Bhuj, Jabalpur, Muzaffarpur and provision of electric and water supply at various aerodromes.

63. In addition, construction of many major and minor works at various aerodromes have been sanctioned and the works will be taken up shortly.

Aeronautical Telecommunications.

64. The programme of establishing new Aeronautical Communication Stations, of augmentation of existing aeronautical communication facilities at Aeronautical Communication Stations and provision of additional facilities wherever necessary due to the changing pattern of air routes were actively pursued during the year 1959. Obsolete equipment on several channels were replaced by modern ones at a number of stations. One hundred and thirty-five radio aids to navigation and 548 aeronautical communication channels were available at 80 Aeronautical Communication Stations maintained by the Civil Aviation Department in the beginning of 1960, as shown in Appendix III.

65. Aeronautical Communication Stations were established at Banihal, Kandla, Pataudi and also at Bhuntar to meet the operational requirements of air services along these routes.

Low power M. F. Radio Beacon commenced operation at Pataudi. VHF Omni-Ranges (VORs) were installed and have been placed on operation on an experimental basis at Coimbatore, Ahmedabad and Nagpur pending flight checks. The facility has also been installed at Madras.

Visual automatic VHC DFs (Direction Finders) AD-200 were put into operation at Jharsuguda, Vijayawada, Visakhapatnam and Allahabad, replacing Manual VHF DFs at these places.

Air/Ground en-route communication on HF RTG was augmented at Trivandrum, Varanasi, Bhavnagar, Bhubaneshwar, Coimbatore, Tezpur and Indore.

En-route communication on VHF RT channel was introduced at Madras and Bombay.

Manual W/T circuit between Calcutta and Karachi was converted to RTT.

Landline teleprinter circuits were introduced between Delhi-Bombay and Delhi-Amritsar.

Public Address Systems were installed at Pathankot and Bhavnagar.

66. Speech Recorders (seven channel) were installed and put into operation at Lucknow, Bagdogra and Mohanbari for recording important speech circuits at these places. Similar Recorder was put into commission at Safdarjung replacing the 4-channel recorder there.

67. The total number of transmitters, receivers, power units, measuring instrument, transformers, chokes, engines and other miscellaneous items repaired/tested in the CRC Unit is approximately 7640. The number of crystals supplied by CRC Unit to other Government organizations is 232.

68. The 22nd and 23rd Meetings of the Communication Consultative Committee were held in April and December, 1959 respectively. Items of interest in the field of Aeronautical Telecommunication as far as India is concerned were discussed with airline operating companies and other organisations concerned.

Aeronautical inspection organisation.

69. A twenty-four hours supervision on the maintenance of aircraft at major aerodromes was continued in order to ensure the airworthness of aircraft and to promote the safety of operations. On 1st December 1959, five hundred aircraft held current certificates of registration and one hundred ninety aircraft held current certificates of airworthiness.

70. Two hundred and two aircraft were inspected for the issue or renewal of certificates of Airworthiness. These included two aircraft registered in foreign countries.

71. During the year 1959, six ultra-light "PUSHPAK I" aircraft designed and manufactured by the Hindustan Aircraft (Private) Ltd. were registered. This adds a new type to the Indian Registered aircraft.

72. During the year under review, 76 aircraft Maintenance Engineers' Licences were issued. The total number of Aircraft Maintenance Engineers' Licences current at the end of November 1959 was 1089.

Report of the Raha Committee.

73. The recommendations concerning (i) training of Civil Air Pilots, and (ii) selection of trainees, made under Sections B and C of the Report of the Committee, which was appointed under the Chairmanship of Shri K. M. Raha, the present Director General of

Civil Aviation, to review the existing facilities for selection, Training and Licensing of Civil Air Pilots, have been examined by the Government. The details of these recommendations and the decisions of the Government thereon are given in Appendix IV. The recommendations of the Committee concerning the licensing of Civil Air Pilots made in Section A of the Report have also accepted by Government.

Civil Aviation Training Centre, Allahabad.

74. The Civil Aviation Training Centre, Allahabad, comprising Flying, Aerodrome, Engineering and Communication Schools, with an allied repair and overhaul organisation, continued to provide efficient training facilities.

75. During the period from 1st January to 30th November, 1959, 43 trainees completed the Flying Training Course in the Flying School. At the Aerodrome School, 21 Assistant Aerodrome Officers and 10 Aerodrome Operators completed the *ab-initio* course in Air Traffic Control; and 13 Aerodrome Operators, 15 Assistant Aerodrome Officers and 53 Fire Service Personnel underwent refresher course. At the Communication School, 18 trainees completed Radio Operators Advanced Refresher Course; 15 Radio Technicians Advanced Refresher Course; 10 Officers Refresher Course; 27 Special V.O.R. Course, 13 Teleprinter Maintenance Course and 15 Long Range Course MF R/T At the Engineering School, training was imparted to 13 Aircraft Maintenance Engineers. The candidates from foreign countries who completed training at the Civil Aviation Training Centre, Allahabad during the period under review included two Afghan, one Philippine; one Nepalese and one Thai nationals and one candidate from Singapore.

76. At the end of November 1959, there were 140 trainees on the rolls of the Civil Aviation Training Centre, undergoing training in different courses. This number included one Nepalese national and three candidates from Singapore. An expenditure of Rs. 14,69,950 was incurred on the centre during 1958-59. The estimated expenditure to be incurred on the centre during 1959-60 is Rs. 18,01,000.

Flying Clubs, Gliding Clubs and Allied Institutions.

77. At the end of November 1959, there were 16 subsidised flying clubs in India with their headquarters at Delhi, Bombay, Madras, Barrackpore, Patna, Bhubaneswar, Nagpur, Jullundur, Jaipur, Trivandrum, Indore, Bangalore, Hyderabad, Gauhati, Baroda and Lucknow (with satellite centres at Allahabad, Kanpur and Banaras). The Kerala Flying Club was inaugurated at Trivandrum on 16th September, 1959. The Gujarat Flying Club was inaugurated at Baroda on 24th October, 1959. An expenditure of Rs. 19,36,432 was incurred on the payment of subsidies to Flying Clubs during 1958-59.

78. With a view to promoting air-mindedness among the youth of the country, 60 scholarships were sanctioned during the year 1959-60 to the deserving students for receiving training at the Flying Clubs. Under the Scholarship scheme, each scholarship holder is entitled to receive 50 hours of flying training free of cost. The Selection of the candidates is done through the Aero Club of India. Not less than 12½% of the scholarships are reserved for candidates from scheduled castes and scheduled tribes.

79. The Government Gliding Centres at Allahabad, Bangalore and Poona continued to provide gliding training facilities. The Delhi Gliding Club, New Delhi, continued to be subsidised by the Government during 1959-60. The Birla Gliding Club, Pilani has also been admitted in the Government subsidy scheme with effect from the 1st October, 1959. On the 31st October, 1959 there were 727 flying members at the Delhi Gliding Club, New Delhi and the three Government Gliding Centres. A grant of Rs. 28,000 was paid to the Delhi Gliding Club during 1958-59. The expenditure incurred on the three Government Gliding Centres during 1958-59 was Rs. 1,29,034.

80 A grant-in-aid of Rs. 13,000 was given for the Aero Club of India and Rs. 5,000 to the Aeronautical Society of India during 1958-59. The Aeromodellers' Association, Calcutta was also given a grant of Rs. 2,000.

81. The 4th All-India Air Rally was held at Jaipur under the auspices of the Aero Club of India from 30th September to 2nd October, 1959. At the conclusion of the Rally, prizes were distributed by the Prime Minister, Shri Jawaharlal Nehru. The Prime Minister also presented to Mr. F. Pourschasb, Gliding Adviser, Civil Aviation Department, the "Diplome Paul Tissandier" awarded this year by the Federation Aeronautique Internationale, for his pioneering work in gliding in India

82. The total number of 'A' and 'B' Pilots trained by the various Flying Clubs during the year 1959 (upto 30th November 1959) is 185 and 9 respectively. The number of persons undergoing training in the various Flying Clubs on 1st December 1959 was 669.

RESEARCH AND DEVELOPMENT.

Type Certification of "Ashvini" Glider.

83. The "Ashvini" two-seater training glider designed and constructed by the Technical Centre of the Civil Aviation Department, having satisfactorily completed all flight trials and other relevant tests, was Type-Certificated on the 22nd February, 1959 by the Director General of Civil Aviation.

84. On the first launch, the "Ashvini" was aero-towed and released at a height of 2500 ft. The "Ashvini" demonstrated its capability by performing six continuous spins, several loops, stall-turns and a low high-speed run. The second launch was effected by a winch demonstrating its steep rate of climb. Released from a height of about 1200 ft the glider was put through four loops before landing.

85. The First prototype of the "Ashvini" Two-Seater Training Glider was assessed for flight characteristics by the ace German Pilot, Miss Hanna Reitsch during her visit to India. Miss Hanna Reitsch in her assessment report has stated:—

> "I am of the opinion that the "Ashvini" will be a good Training Glider for use by the Gliding Clubs and Gliding Centres for imparting training in soaring flights as well as aerobatics. The glider has very safe flight characteristics and is apparently of sturdy construction with a reserve of strength I wish the glider every success and very good future".

86. The third proto type "Ashvini Glider" was test flown on 23-11-59.

GLIDER WINCH:

87. Efforts are also being made for the manufacture of glider winches indegineously. A proto type winch has been developed by M/s Jupitor Motors, which is undergoing evaluation test at the Delhi Gliding Club.

TWO SEATER 'PUSHPAK' MKI.

88. A Technical Certificate to the Two-Seater 'Pushpak' MK. I aircraft built by the Hindustan Aircraft Limited was issued by the Type Acceptance Committee. Based on this Technical Certificate which contains all the technical date and operating limitations for this aircraft, the Type Certificate was issued by the Research and Development Directorate of the Civil Aviation Department to the Hindustan Aircraft Ltd. The Type Certificate certifies that the aircraft is of proper design, material specification and performance for safe Operation.

89. During the visit of the Handley Page Herald aircraft to India on demonstration flights, take-off and landing tests were conducted at the Delhi (Safdarjung) airport by using C.A.A. Take-off camera.

INTERNATIONAL RELATIONS.

India-United Kingdom Air Services Agreement.

90. The India/U.K. Air Services Agreement, was reviewed in three inter-governmental discussions between official delegations.

The first discussion was in January, 1959 in New Delhi, the second in London during August-September, 1959 and the last one in January-February, 1960 in New Delhi.

91. The last discussion took full account of the partnership arrangements recently concluded between B.O A.C., A.I.I. and QANTAS and the two delegations agreed to arrangements for the operation of commercial air services between the two countries in accordance with the air Services Agreement.

India-Italy Air Services Agreement.

92. A bilateral Air Services Agreement between the Government of India and the Government of Italy which was initialled in New Delhi on 2nd August, 1958 was signed at Rome on 16th July 1959 by Shri Khub Chand, Ambassador of India in Italy, on behalf of the Government of India and by H. E. Hon'ble Alberto Folchi, Under Secretary of State for Foreign Affairs, on behalf of the Govt. of Italy.

India-Australia Air Services Agreement.

93. Discussions between delegations representing the Indian and Australia Governments on the operation of Air services between the two countries by the designated airlines under the India/ Australia Air Services Agreement began on 29th September, 1959 and were concluded on 5th October, 1959.

94. The necessity for amending the present Agreement which was concluded in July 1949, was discussed. It was mutually agreed that with a view to agreeing to amendments to the present Air Services Agreement, or concluding a new Agreement, further inter-Governmental discussions should commence by the end of February, 1960.

Polling arrangements between A.I.I./B.O.A.C. and Q.E.A.

95. The Air India International signed an Agreement with the B.O.A.C. and the Qantas Empire Airways on the 4th December, 1959, according to which the three airlines will pool their revenue on certain routes operated by them and share them on an agreed basis. The Agreement has still to be approved by the respective Governments.

INTERNATIONAL CIVIL AVIATION ORGANISATION.

96. Shri G. C. Arya, Representative of India on the Council of International Civil Aviation Organisation represented the Government of India at the Special Communication/Operation/Rules of the Air and Air Traffic Control (COM/OPS/RAC) Meeting of ICAO held in Montreal from the 10th February to the 2nd March, 1959.

97. Shri G. C. Arya, Representative of India on the Council of International Civil Aviation Organisation represented the Government of India at the Aeronautical Information Services and Aeronautical Charts (AIS/MAPS) Division Meeting of ICAO held in Montreal from the 28th April to the 25th May 1959.

Assembly of International Civil Aviation Organisation-Twelfth ....Session ....

98. India was represented at the Twelfth Session of the Assembly of the International Civil Aviation Organisation which opened at San Diego, California, U.S.A. on 16th June, 1959 by a four-member delegation led by Shri K. M. Raha, Director General of Civil Aviation. Other members of the delegation were Shri G. C. Arya, Representative of India on the Council of ICAO at Montreal, Shri B. S. Gidwani, Deputy Director, Civil Aviation Department and Sq. Ldr. L. B. Joseph, Assistant Air Attache, Embassy of India, Washington.

99. At the election held at the Twelfth Session of the Assembly of ICAO, India was re-elected to the Council of the International Civil Aviation Organisation for the three year term commencing from 1959.

Joint Mid East/South East Asia Regional Air Navigation Meeting.

100. A delegation consisting of Dr. P. Koteswaram, Director, Aviation Services of the India Meteorological Department and Dr. Saroj Dutta, Deputy Director of Communication, Shri I. S. Ahuja, Controller, Central Radio Stores Depot and Shri J. N. Dhar, Assistant Director, Air Routes and Aerodromes of the Civil Aviation Department represented India on the Joint-Middle East/South East Asia Regional Air Navigation Meeting of the International Civil Aviation Organisation held at Rome from the 7th January, 1959 to 3rd February, 1959.

Fifth Session of the Meteorological Division of the International Civil Aviation Organisation.

101. A delegation consisting of Shri P. R. Krishna Rao, Deputy Director General of Observatories and Dr. P. Koteswaram, Director, Aviation Services of the India Meteorological Department represented the Government of India at the Fifth Session of the Meteorological Division of the International Civil Aviation Organisation and the Second Session of the Commission for Aeronautical Meteorology of the World Meteorological Organisation convened jointly in Montreal (Canada) on the 1st September, 1959.

102. Major items on the agenda of the meetings concerned the special needs of the fast and high-flying jet aircraft now in regular operation on the world air routes.

Fifth Session of the facilitation Dn. meet of ICAO.

103. A delegation consisting of Shri B. Deva Rao, I.F.S., First Secretary, Indian Embassy, Rome and Shri T. Khushal Singh, Director, Tourist Office, London represented India at the Fifth Session of the Facilitation Division Meeting of the International Civil Aviation Organisation convened on 1st December, 1959 at Rome. The meeting considered mainly questions on facilitation of civil air transport services.

Facilitation Committee

104. The 10th and the 11th meetings of the Facilitation Committee were held at New Delhi on the 9th April 1959 and 3rd December 1959 respectively. Representatives of foreign airlines, Air India International, Indian Airlines Corporation, the Ministries of Finance (Revenue Division), Home Affairs, Health, Transport and Communications and of the Civil Aviation Department attended the meetings. The Air Adviser to the U. K. High Commission and a representative of the International Civil Aviation Organisation were also present as observers.

105. Problems relating to Health, Immigration and Customs Clearance procedures at airports were discussed at the meetings.

Deputations.

106. The Services of Shri C. R. Rao, Director of Communication were placed at the disposal of the International Civil Aviation Organisation with effect from the Afternoon of the 16-4-59 for appointment as Chief of the I.CAO Technical Assistance Mission in Indonesia.

107. The Services of Shri B. K. Rakshit, officiating Assistant Director of Communication were placed at the disposal of the Government of Ghana with effect from the afternoon of the 12-6-59.

108. The services of Shri K. N. Bahl, Controller of Communication were placed at the disposal of the International Civil Aviation Organisation for appointment as Radio Operations Instructor in Afghanistan under the ICAO Technical Assistance Mission.

109. Sarvashri J. Pattabiraman and K. N. Gopalakrishanan, Senior Technical Officers, were deputed to U.S.A. for training respectively in "Installation, Maintenance and operation of G.C.A. and other Radar facilities" and "Radio Engineering with special reference to organisations of point-to-point Radio Telegraph, tele-type, telephone, communications with emphasis on semi and complete automitization" under the point Four Programme from the afternoon of the 23rd and 28th July respectively.

110. The services of Shri C. R. Thirumalai, Dy. Controller Radio Construction and Development Units, New Delhi were placed at the disposal of the Government of Ghana with effect from the afternoon of the 7-9-1959.

111. Shri B. R. V. Vardan, Senior Technical Officer, Radio Construction and Development Units Civil Aviation Department was placed on deputation to U.S.A. w.e f. the afternoon of the 29th September 1959 for training in "Flight Check and Calibration of Radio Aids to Navigation with special reference to I.L.S., V.O.R. and Radar System" under Point Four Programme.

112. Sarvashri S. D. Bahl and V. Chellappa, Senior Aircraft Inspectors, were placed on deputation to the U. K. w.e.f. afternoon of the 17-10-59 and 21-10-59 respectively for training under the Colombo Plan.

Accidents.

113. During the period from 1st January to 31st December, 1959, there were 32 major accidents in India involving 26 Indian registered aircraft, 2 foreign registered aircraft and 5 gliders Eight of these accidents were fatal resulting in the death of 41 lives, including eighteen members of the crew and 23 passengers.

114. Fifteen Airmiss incidents involving Civil aircraft were also reported during the same period.

115. Seventeen of the Indian registered aircraft (including four gliders) involved in major accidents were engaged on instructional flights, three on scheduled passenger services, two on non-scheduled passenger services, four on non-scheduled freighter services and five (including one glider) on private, cross-country and Miscellaneous flights. One of the foreign registered aircraft involved in major accident was engaged on scheduled passenger service and the other on non-scheduled passenger service.

116. One of the accidents to a Dakota aircraft which crashed while operating a scheduled passenger service from Agartala to Silchar was investigated by a Court of Inquiry appointed by the Government of India. The rest of the accidents were investigated by Departmental Inspectors.

117. A brief description of the fatal accidents is given below:—

(i) Accident to a Pionyer type two-seater glider of the Birla Gliding Club, Pilani, at Delhi (Safdarjung) airport on 19th January 1959 during a towed take-off by a Tiger Moth aircraft VT-DKM resulting in the death of the Glider pilot.

(ii) Accident to a privately owned Dominie aircraft VT-ARY, at a place 7 miles East-north-east of Mohanbari on 9th February, 1959, while engaged on a private flight from Joyhing Tea Estate (8 miles from North Lakhimpur in Assam) to Mohanbari, resulting in the death of both the occupants of the aircraft—the pilot and a passenger.

(iii) Accident to a Dakota aircraft VT-CYH of the Indian Airlines Corporation, at a place 10 miles east of Tuensang on 12th March, 1959, while engaged in dropping food supplies in the area of the North East Frontier Agency, resulting in the death of all the three members of the crew and two of the supply dropping personnel and causing minor injuries to the remaining two supply dropping personnel.

(iv) Accident to a Tiger Moth aircraft VT-AQJ belonging to the Government of India and operated by the Bihar Flying Club, at Patna aerodrome on the 20th March, 1959, while approaching to land, resulting in the death of the student pilot who was the sole occupant.

(v) Accident to a Dakota aircraft VT-CGI of the Indian Airlines Corporation, at a place 15 miles South-west of Hailakandi on the 29th March, 1959, while operating a scheduled passenger service from Agartala to Silchar, resulting in the death of all the occupants of the aircraft—twenty passengers and the four members of the crew.

(vi) Accident to a Dakota aircraft VT-DGP belonging to the Hindustan Aircraft Ltd., Bangalore and operated by Kalinga Airlines, near village Sagong, 15 miles South-west of Along on the 3rd August, 1959, while engaged on a non-scheduled freighter service from Mohanbari to Along, resulting in the death of all the occupants of the aircraft—the pilot the co-pilot, the Radio Officer, an attendant and two members of the staff of Assam Travels.

(vii) Accident to a Tiger Moth aircraft VT-ARP of the Madras Flying Club, at a place approximately 600 yards North-east of Madras (St. Thomas Mount) airport on 1st July, 1959, while flown solo by a student pilot, resulting in the death of the pilot.

(viii) Accident to chipmunk aircraft VT-CXA operated by the Civil Aviation Training Centre, Allahabad near Manauri Air Force Station on 18-12-1959 flown solo by a student pilot for a night flight in connection with the

issue of his 'B' License, resulting in the death of the pilot. The aircraft was destroyed.

118. During the year 1959, Air Safety Circular No. 8 and Survey of Accidents to Indian Registered Aircraft during 1958, were issued by the Department.

BUDGETARY POSITION.

119. The table below gives the budget estimates for the years 1959-60 and 1960-61:—

	B. E. 1959-60	R. E. 1959-60	B. E. 1960-61
	Rs.	Rs.	Rs.
(*i*) Air Corporations			
(*a*) I. A. C. : Building . . .	25,32,000	18,12,000	16,00,000
Miscellaneous items of Capital expenditure	54,84,000	47,63,000	1,59,71,000**
(*b*) A. I. I. C. : Purchase of aircraft . . .	2,55,00,000	2,55,00,000	1,93,00,000
Workshop Expansion . . .	33,00,000	33,00,000	..
(*c*) Air Transport Council . . .	2,000	2,000	2,000

**According to the decision taken recently, losses incurred by the Indian Airlines Corporation upto 31-3-59 would be re-imbursed to them as subsidy. The total accumulated losses of the Corporation upto that period come to Rs. 588 81 lakhs, Rs. 231·99 lakhs represen-presenting cash losses and Rs. 356 82 lakhs representing depreciation. The cash losses amounting to Rs. 231·99 lakhs would be adjusted against the loans granted to the Corporation upto the year 1958-59. The total loan granted to the Indian Airlines Corporation amounted to Rs. 391·70 lakhs which will be adjusted as follows:—

(*i*) Adjustment towards subsidy payable	Rs. 231 99 lakhs
(*ii*) Transfer to 72 Capital Outlay	Rs. 159 71 lakhs
TOTAL	Rs. 391 70 lakhs

The provision made in the Budget Estimates for 1960-61 amounting to Rs. 159·71 lakhs under Capital is intended to cover the above adjustment.

	B. E. 1959-60	R. E. 1959-60	B. E. 1960-61
	Rs.	Rs.	Rs.
(*ii*) *Civil Aviation Department.*			
(*a*) Capital Expenditure (including 'Charged' Expenditure) . . .	4,38,27,000	4,38,27,000	4,60,60,000
(*b*) Revenue Expenditure . . .	7,09,37,000	11,67,82,810	6,81,59,360
(*iii*) Contribution to International Civil Aviation Organisation . . .	6,66,000	5,48,000	5,16,700

120. Revenue Receipts.—The revenue likely to be derived by way of landing and housing charges, leasing out of hangers, buildings and lands, etc. at Civil aerodromes for the year 1959-60 and 1960-61 is estimated at Rs. 100·91 lakhs and Rs. 102 06 lakhs respectively.

SECTION IV—INDIA METEOROLOGICAL DEPARTMENT

Functions and Organisation of the Department

121. The India Meteorological Department provides weather service to a large variety of interests, including civil and military aviation, mercantile and naval shipping, ports, agriculture and Community Project Centres, public works, railways, Posts and Telegraphs, Industries and Commerce, public health and the general public.

122. The Department functions both as a service and as a scientific Department. On the service side, the functions of the Department include the organisation and maintenance of the basic network of meteorological observatories—both surface and upper air—required for the preparation of day-to-day weather reports, forecasts and warnings, the issue of warnings against storms, heavy rainfall, frost, etc., the issue and dissemination of farmers' weather bulletins, with an outlook of weather for two to three days, for the benefit of agriculturists, the publication of seasonal forecasts of rainfall during the monsoon and the cold weather periods, the compilation of meteorological statistics pertaining to the country and the supply of climatological data to diverse users. The Department's functions on the scientific side include a study of the science of meteorology and climatology in all aspects with particular reference to India and the neighbourhood and also Terrestrial magnetism and atmospheric electricity, ionosphere, astronomy and astrophysics and seismology.

123. The Director General of Observatories is the Head of the Department with his headquarters at New Delhi. He is assisted by 5 Deputy Directors General, two at New Delhi (one in the Headquarters Office and the other incharge of the Instrument Branch), two at Poona (in-charge of Forecasting and Climatology & Geophysics Branches) and one at Kodaikanal incharge of the Astrophysical Observatory at Kodaikanal. The observational net-work and the provision of meteorological services to various interests are controlled through five Regional Meteorological Centres located at Bombay, Calcutta, Madras, Nagpur and New Delhi each under the charge of a Director. The weather services to the various users are provided by the Central Weather Office at Poona, the Meteorological Offices at Alipore (Calcutta) and Colaba (Bombay), six other Main Meteorological Offices located at the airports at Bombay (Santacruz),

Calcutta (Dum Dum), Madras (Meenambakkam), New Delhi (Safdarjung), Nagpur (Sonegaon) and Gauhati and a large number of smaller meteorological offices and observatories. The Colaba and Alibag Observatories at Bombay deal with terrestrial magnetism and atmospheric electricity and the two field magnetic observatories at Annamalainagar (Madras) and Trivandrum (Kerala) function under the guidance of Colaba and Alibag Observatories. The Kodaikanal Observatory specialises in the study of solar physics and is also equipped for Stellar astronomy and spectroscopic, ionospheric and radio-astronomical observations it has also a magnetic observatory. The Central Seismological Observatory at Shillong is the coordinating Centre for the issue of seismological bulletins, by collection of data from various seismic stations in India. A special section of the Regional Meteorological Centre, Calcutta, is responsible for the compilation of the Indian Ephemeris and Nautical Almanac. The officers at Bombay and Calcutta issue time signals for the use of ships at sea, the telegraphic system in the country and the public.

Review of the activities during the period January, 1959 to December, 1959

124. Observational Organisation.—The intensive observational programme which was started during the International Geophysical Year (1957-58) was continued on more or less the same scale in furtherence of the I.G.C. (International Geophysical Co-operation) Programme.

125. During the year, one Decca Type Storm-Detecting Radar was installed at the Madras (Meenambakkam) Aerodrome. with this addition, ground weather radar facilities are now available at five major aerodromes in India viz. Calcutta (Dum Dum), Bombay (Santacruz), Delhi (Safdarjung), Nagpur (Sonegaon) and Madras (Meenambakkam). Arrangements were in progress to instal a storm-detecting Radar at the Gauhati aerodrome.

126. Fourteen new surface observatories were started, and six which were not required were closed, during the year. Two state raingauge stations were taken over by the Department as Class V Co-operating observatories. The technical control of the Supplementary Meteorological Offices (S.M.Os.) at Kabul and Kandahar was transferred to the Afghan Met. Service.

127. The work of modernisation of the observational equipment at aerodromes was continued.

128. The observational organisation at the end of 1958 consisted of:

Hydrometeorological Observatories	261
Surface Observatories	387
Pilot Balloon Observatories	53
Radiosonde Observatiroes	13
Radiowind Observatories	12
Radar Observatories	5
Atmospherics Observatories	2
Ozone Observatories	2
Seismic Observatories	12
Magnetic Observatories	4
Atmospheric Electricity Observatories	4
Inosopherics Observatories	1
Astrophysical Observatories	1
Cosmic Ray Observatories	1
Time Signals Stations	2

Meteorological Service to Aviation

129. Arrangements were made to provide meteorological facilities of a specialised nature to BOAC Comet IV Jet Air Service which commenced regular operations through India from 1st April, 1959, on their Bombay-Bahrein, Bombay-Colombo, Calcutta-Bangkok, Calcutta-Rangoon, Calcutta-Singapore, Calcutta-Hong Kong, Delhi-Teheran and Delhi-Rangoon routes. The service to Hong Kong is the longest direct service operating from Calcutta. In this connection, arrangements were made for the exchange of meteorological data and forecasts with the Met. Offices at Rangoon, Bangkok, Hong Kong, Tainan, Tourane and Manila.

130. Some of the other important International Air Services introduced during the year for which meteorological facilities were arranged, are the following:

(i) Alitalia Air Service on the route Bombay-Karachi-Rome.

(ii) Czechoslovakian —TU 104 Jet Service on Bombay-Bahrein route.

(iii) Kuwait Airways on Bombay-Karachi route.

(iv) Lufthansa, German Airlines on Calcutta-Bangkok and Calcutta-Karachi routes.

131. In connection with the projected Boeing Jet Aircraft Service of the Air-India International, the meteorological office at Santacruz (Bombay) continued to supply the necessary special meteorological information about winds, temperature, etc. upto 40,000 feet, for the 'paper flight operations' over the routes Bombay-Beirut, Bombay-Cairo and Bombay-Calcutta- Bangkok.

132. For rendering efficient met. service to International Air Services operating from and through India, exchange of met. information between Meteorological Offices in India and neighbouring countries was arranged as recommended in South East Asia and Middle East Regional Plans of the I.C.A.O and as necessitated by International flight schedules. Arrangements were also made for rendering necessary met. service for flights over new and reorganised routes of the Air India International and the Indian Airlines Corporation. Met. facilities were also provided for the Air rally at Jaipur in October, 1959.

133. A Current Weather Observatory was established at Bhuntar airfield (Kulu Valley) for provision of met. facilities to the newly started IAC Service Delhi-Chandigarh-Kulu.

134. At the end of the year the organization for the provision of meteorological services to aviation, national as well as international, consisted of six Main Met. Offices (MMOs) located at the major aerodromes Bombay (Santacruz), Calcutta (Dum Dum), Delhi (Safdarjung), Madras (Meenambakkam), Nagpur (Sonegaon) and Gauhati; eight Dependent Met. Offices (DMOs) at Agartala Ahmedabad, Allahabad (Bamrauli), Bangalore, Dibrugarh (Mohanbari), Hyderabad (Begumpet), Jodhpur and Lucknow (Amausi); 18 Supplementary Met. Offices (SMOs) at other aerodromes and 42 Current Weather Observatories along air routes. The Meteorological office at Barrackpore airfield was handed over to the Indian Air Force Met. Branch from 1st March 1959. Weather reports and forecasts were broadcast for the benefit of aviation from the Area Met. Broadcast Centre at Bombay, the four VOLMET Broadcast Centres at Bombay, Calcutta, Delhi and Madras and 31 Aero Broadcast Stations in the country. Half hourly Aeros were also broadcast on the beacon at Bombay, Calcutta, Delhi, Nagpur, Madras and Gauhati.

135. The total number of forecasts of different types issued during the year was approximately 3,00,000. Met. briefing, before take off, regarding meteorological conditions expected during flights was done on 56,200 occasions; and debriefing on landing, regarding weather experienced by the pilots during flights, was done on 11,000 occasions.

Meteorological Service for VIP Flights

136. Special arrangements were made for the provision of Meteorological facilities for the flights of His Royal Highness the Duke of Edinburgh in January, 1959, and of President Eisenhower and party in December 1959. Arrangements were also made for

providing adequate met. facilities for a number of other VVIP and VIP flights carrying foreign and Indian dignitaries who toured the country during the year.

Meteorological Service for the Defence Services

137. The Department provided nine trained Met. Officers to the I.A.F. Met. Branch by Secondment.

138. The reciprocal arrangements under which the Department meets the repuirements of the IRF, at air-fields where civil meteorological offices function and vice versa, were continued as in the previous years. Similar co-operation continued between the Naval Met. Office, Cochin and this Department.

139. Services to Shipping.—Two routine daily weather bulletins and 'extra', 'Storm' and 'special' bulletins during disturbed weather, continued to be issued for the benefit of shipping in the Indian Seas, Weather bulletins and forecasts were also issued through the Naval Wireless Stations to meet the requirements of Naval Ships.

140. The total number of weather bulletins issued to ships during the year was 2,300. The Meteorological Office Calcutta, commenced supply from June, 1959 of special weather bulletins to the Port Commissioner, Andamans, for the Andaman Sea bounded by Lats. 7° and 14°N and Long. 92° and 94°E with particular reference to the east coast of the Andamans.

141. The ships of the Voluntary Observing Fleet were visited by the officers of this Department, when they called at Bombay and Calcutta, to ensure that the met. instruments on the ships were properly maintained and that the concerned officers on ships were conversant with the codes and procedures for reporting of met. observations.

142. As in the previous years, weather reports were received from both Indian and foreign ships sailing in Indian waters. During the year there were 108 ships in the 'Voluntary Observing Fleet' organized by the Department to obtain weather reports from ocean areas. Of these, 42 were in the category of 'selected' and 43 in the category of 'Supplementary Ships' equipped with tested met. instruments. In addition 13 ships enlisted as auxiliary ships during the I.G.Y. programme continued to report observations. Similarly weather observations continued to be received from the Naval ships also.

143. To encourage the voluntary work done by the ships in recording and transmitting weather observations, awards in the form of scientific books were made for excellent work to officers of 5 ships of the Indian 'Voluntary Observing Fleet'.

144. Service to Ports.—Storm warning messages advising ports to hoist cautionary, warning or danger signals as necessary were issued by the Meteorological Office at Colaba (Bombay) for ports along the west coast and by the Meteorological Offices at Calcutta and Madras for ports on the East Coast. The number of ports on the warning lists of the Meteorological Offices at Bombay, Calcutta and Madras during 1959 were 81, 16, and 13 respectively.

Service to Fishing Craft

145. Warnings of weather along and off the coast were issued to Fisheries officials of Madras, Mysore and Kerala States for transmission to small fishing craft before they put out to sea. Fishery officials in Pondicherry would also start getting such warnings soon.

Inland Warnings

146. The issue of warnings for adverse wether such as heavy rainfall, gales, frost, etc. to a large number of officials including districts and police authorities and officers of the Irrigation, Agriculture, Railways, Telegraphs, Public Works and Fisheries Departments continued to be one of the important functions of the Department, and about 9,400 warnings were issued during the year by the various forecasting offices. To enable this department to assess the extent to which the warnings were being utilised and to examine whether any improvements were needed, the warnees were invited to visit the warning centres whenever possible. Arrangements were also made for officers of the Department undertaking visits to Ports, Community Project Centres/Blocks, etc. to contact important officials on the inland warning lists and to discuss with them the utility of the warnings, their adequacy and suggestions for their improvement.

147. The Madras State Police Wireless network was continued to be utilised during the year for the quick dissemination of cyclone weather warnings to warnees in the State on occasions of breakdown of landline communication during severe weather. Similar arrangements were also made during the year for Andhra Pradesh. Arrangements have also been made for the use of Inter-State Police Wireless Stations at Madras and Hyderabad for the transmission of weather warnings in the event of breakdown of all other means of communications.

Service to Agriculture and Community Project Centres

148. The issue of Farmers' Weather Bulletins containing forecasts for the next 36 hours with a further outlook for the subsequent two days was continued. The bulletins were broadcast daily from 28 stations of the A.I.R. located in 15 states in 20 local languages.

These were also issued for publication in the daily newspapers Bulletins were also supplied telegraphically to individual subscribers.

149. The scheme for the dissemination of special warning messages to rural areas through selected Community Project Centres and National Extension Service Blocks was continued. Under this scheme, special warning messages were issued by telegram by the Regional Forecasting Offices on important occasions like the first burst of monsoon rains, heavy rainfall, strong winds, cyclonic storms, break in the monsoon rains, etc. Similar messages were also issued to officials in selected project areas whenever weather adverse to crops was anticipated. A close liaison was maintained with Community Development Block/N.E.S. Centres through the visits of the officers of this Department. The number of selected Community Centres and N.E.S. Blocks spread over the country which were on the warning list of the Department was 480 at the end of the year. About 9600 special messages were issued to these officials during 1959.

Service to Public

150. The issue of the All India Daily Weather Report by the Meteorological Office at Poona and the Regional Daily Weather Reports by the Meteorological offices at Bombay, Calcutta, New Delhi, Madras and Nagpur for the benefit of the public was continued. Reports relevant to the particular States were issued by the Meteorological offices at Bangalore and Hyderabad. Telegraphic summaries of the various weather reports and forecasts were supplied to 25 subscribers in the country and actual reports mailed to 140 subscribers. The daily reports are being published in 73 newspapers in the country in English and the regional languages concerned. 3 Newspapers publish the daily weather map for 0830 hrs. I.S.T.

151. In addition to the daily reports, the Weekly Weather Reports, the Monthly Weather Review and an Annual Summary for India continued to be issued from the Meteorological Office at Poona for the information of the public. The Meteorological Office at Madras issues a Monthly Summary for the States of Andhra Pradesh, Madras, Mysore and Kerala for the local newspapers and for the use of Government institutions and Departments interested in the weather of the region.

152. The daily weather bulletins were broadcast regularly by All India Radio Stations, some in the afternoon and some in the night transmissions. The All India Weather Bulletin was regularly broadcast in the evening news cycle of A.I.R., New Delhi. Local

forecasts were also announced by A.I.R. Stations, 6 of which give local forecast twice a day. During periods of severe weather endangering life and property, special bulletins were issued to A.I.R. for immediate announcement by interruption of the existing programme.

153. In response to requests from Government and private organisations, forecasts for special occasions were issued from time to time. Special weather forecasts and warnings were supplied by the Main Meteorological Office (MMO) Delhi to the Plan Protection authorities in connection with the air spray operations in Rajasthan. Weather reports were also supplied daily to the newly constituted Flood Forecasting Unit of the Central Water and Power Commission, New Delhi.

154. A new feature of the weather service to the public in Delhi and Calcutta was the introduction of Telephone weather service by which local forecasts can be obtained over phone by dialing the appropriate number. Another important feature at Delhi was the display of daily weather maps, local forecasts, etc. in the Central Hall of Parliament during sessions of the Rajya Sabha and Lok Sabha for information of the members of Parliament.

Meteorological Service for Himalayan Expeditions

155. Arrangements were made for the issue of weather bulletins from the Main Met. Offices at Safdarjung Air port New Delhi and the Meteorological Office at Alipore (Calcutta) for broadcast through the A.I.R. for the benefit of the

(i) Australian Expedition to Dhaulagiri,

(ii) Indian Navy Expedition to Nandakot;

(iii) IAF Expedition to Chaukhamba-Badrinath-Gangotri Glacier,

(iv) Japanese Expedition to Mt. Himachuli, and

(v) French Expedition to Mount Jannu.

156. Special forecasts were also broadcast for the use of pilgrims of Shri Amarnath-ki-yatra.

Meteorological Training

157. The training Section at Poona continued to provide meteorological training to Departmental personnel in all technical cadres (particularly the new entrants) and to a few others sponsored by other departments of Government.

158. 96 departmental candidates and 2 Senior Commissioned Instructor Officers of the Indian Navy completed their training

during 1959. 38 departmental trainees and 3 non-departmental personnel (2 Senior Commissioned Instructor Officers of the Indian Navy and one Scholar from Mauritius) are still under training.

159. A radar training course for departmental personnel was organised at New Delhi. 28 persons were trained during the year.

160. Special training courses in meteorology continued to be held at Bombay, Calcutta, Madras and New Delhi for the pilots and aircrews of the Indian Airlines Corporation. The total number of pilots etc. who attended the courses at various centres was 148.

161. A Meteorologist of the Department continued to be posted at the Civil Aviation Training Centre, Bamrauli (Allahabad) as an instructor in meteorology. Examinations in Meteorology (including viva-voce) for the various aircrew licences were conducted at Bamrauli, Bombay, Calcutta, Madras and New Delhi. The total number of examinations of various types conducted during the year was 16. The number of candidates examined during the year was 13 for the First Class Air Navigators' Licence, 105 for the Second Class Air Navigators' Licence, 46 for the Instrument Rating Certificate and 46 for the Pilots 'B' Licence.

Meteorological Télecommunications

162. The most significant development in meteorological telecommunications was the establishment of a Radio-teletype circuit between Delhi and Moscow which commenced operation from 1st January, 1960 and which will provide the base for the exchange of meteorological data throughout the northern hemisphere.

163. Once daily transmissions by radio-facsimile of weather charts from Poona to the other Meteorological Offices at Santacruz, Nagpur, Madras and Delhi was continued on an experimental basis.

Hydrometeorology and Flood Control

164. The Department continued to render useful service in the field of Hydrometeorology to the Central Water and Power Commission and to the engineers connected with various River Valley and Flood Control Projects in different States. Hydrometeorological observatories set up in this connection for the collection of data from the unrepresented areas in the Himalayas and elsewhere were maintained and the data collected from them was supplied to the different authorities after scrutiny. Advice regarding the adequacy of network of raingauge stations in different irrigation project areas was tendered from time to time to the authorities concerned. Hydrometeorological data, both basic as well as analysed, was supplied to different authorities. Three Hydrometeorological Units continued to work for this purpose at New Delhi, Poona and Calcutta.

165. 261 Hydrometeorological observatories functioned during the year. Seven new hydrometeorological observatories were opened in the Kosi Catchment in Nepal during the year. The data recorded at all these observatories are being collected and processed and supplied to the Central Water & Power Commission, and the various project authorities.

166. A scheme for the annual inspection of 20 per cent of State raingauge stations by inspectors of this Department was started during the year. Rainfall recording officers in the various States were given technical advice about the starting, closing, shifting and/or inspection of raingauge stations in their regions.

167. The D.V.C. Meteorological Unit at the Regional Meteorological Centre, Calcutta, continued to render the meteorological services required by the D.V.C. Engineers and to pursue studies for developing a technique for issue of seasonal rainfall forecasts for the Damodar Valley area. This unit issued a total of about 1,000 forecasts for the D.V.C. Catchment.

168. The meteorological unit set up at Calcutta in connection with the North Bengal Flood Control Scheme of the Government of West Bengal continued to maintain the raingauge stations installed for this purpose in North Bengal and Sikkim area and to compile the data collected from these observatories for supply to the interested parties after scrutiny.

Agricultural Meteorology

169. The Co-ordinated Crop-Weather Scheme for sugarcane which was being financed by the Indian Central Sugarcane Committee was taken over by the Department with effect from the 1st April, 1959 for a period of five years in the first instance. The collection and study of Crop-weather data of paddy, wheat, jowar, cotton and sugarcane were continued.

170. The number of crop-weather stations located in different States increased to 50. The quantitative observations recorded at these stations were supplemented by qualitative observations on the incidence of pests and diseases of crops recorded at a large number of experimental farms. The total number of agricultural meteorological observatories in the country stood at 88.

171. The collection of phenological data on mango, neem, tamarind and babul trees from about 350 stations in India was continued.

172. Experiments on evaporation and evaportranspiration using volumetric, gravimetric and turbulence methods were continued under the scheme on "Water Requirements of Crops" financed by the Indian Council of Agricultural Research.

173. The All India Crop Outlook, based on meteorological charts continued to be prepared and supplied every month to the Ministry of Food and Agriculture. Charts showing crop conditions and locust situations were also prepared from information received from the State Departments of Agriculture and Directorate of Plant Protection.

174. A special refresher course was conducted for the Crop-Weather Observers belonging to the Agricultural Department, Bombay State.

Climatology

175. Under the scheme "Developments in Climatology" sanctioned during the Second Five Year Plan period, the normals of monthly and annual rainfall of 2620 raingauge stations in the different States based on all available data for the period 1901-1950 were calculated and checked. The data regarding the monthly and annual number of rainy days for the fifty year period for all raingauge stations were also verified.

176. The Economic and Statistical Adviser, Directorate of Economics and Statistics, Government of India, New Delhi was supplied with information relating to the classification of the rainfall regions of India into three types—dry, wet and intermediate—together with a statement giving normal dates of onset and withdrawal of monsoon for the revised sub-divisions of India for inclusion in the revised edition of the Indian Crop Calendar.

177. Meteorological normals of certain stations whose data are included in the routine monthly CLIMAT broadcasts from India were furnished to the Secretary General, W.M.O., Geneva. Copies of CLIMAT messages relating to surface and upper air data began to be sent to the U.S. Weather Bureau, Washington, for publication in the Monthly Climatic Data for the World.

178. The Climatological summaries as per requirements of the International Civil Aviation Organisation for 13 important aerodrome stations in India based on data for the 5 years period from 1953 to 1957, were prepared and supplied to Airline Companies. Temperature frequency tables for 9 aerodrome stations were prepared and supplied to the Civil Aviation Department. Percentage frequencies of heights of base of low clouds based on data upto 1955 were computed in respect of 20 Pilot Balloon observatories located at important aerodromes.

179. A large amount of analysed climatological data was supplied to the Indian Refineries (Private) Ltd., New Delhi and the Project

Manager, Canada-India Reactor Project, Bombay. The Czechoslovakian Technical Experts were furnished with meteorological data in respect of Ranchi in connection with the tropicalisation of the proposed Foundry Forge Plant to be installed there. Meteorological data were also furnished to the authorities of the Dandakaranya Project and the Indian Oil Refineries in connection with their Refinery Project at Barauni (Ranchi). Upper air climatological data were supplied to several Airlines operators, the Indian Navy, the Damodar Valley Corporation and several other institutions on request.

Seismology

180. The Central Seismological Observatory at Shillong and the Seismological Observatories at Agra, Bombay (Colaba) Bokaro, Calcutta, Dehra Dun, Kodaikanal, Madras, Port Blair, Poona and Sehore functioned regularly during the year. A building for the seismological observatory at Delhi is under construction on the ridge near the Delhi University. The overhauling and testing of most of the seismological instruments to be installed at the Ridge Observatory, have been completed and some instruments have started functioning there from December, 1959. The Seismological Observatories at (i) Chhatra (which was under the Bihar Government), (ii) Hyderabad and Vizianagaram (under the Andhra Pradesh Government), (iii) Tocklai (Jorhat, Assam under the management of the Indian Tea Association) and (iv) Colombo (Ceylon), continued to co-operate with the Seismological Organisation. The Seismological Observatory at Chhatra was taken over by this Department from Bihar Government in December, 1959.

181. Two short period Wood-Anderson Seismographs were installed in July, 1959 in a cable gallery of the Bhakra Dam for the dual purpose of registering regional earth-quakes and the vibrations of the Dam. The study could not be continued on account of the accident at Bhakra Dam when the entire equipment was completely submerged under water due to flooding of the galleries. In connection with the repairs to the damage at Bhakra Dam the Seismologist collaborated in determining the vibrations due to blast at the Dam site.

182. Certain refinements were incorporated in the Wilson Lamison type Vertical component Seismometer constructed last year. More such instruments will now be constructed in the Departmental Workshop for improving the existing equipment at Indian Observatories.

183. Action was initiated to make strong motion seismometers of Japanese type for installation in and near the seismic zones.

Normal routine work of Collections, scrutiny and publication of Seismological data and routine exchange of data with the Bureau Central Seismologique, International, Strasbourg, the United States Coast and Geodetic Survey and the Geophysical Institute, Quetta, (Pakistan) was continued.

Meteorological Instruments

184. During the year under review one low power Decca Weather Radar was installed at Meenambakkam Aerodrome, Madras. The installation of a similar Radar at Gauhati aerodrome has been taken up. Preliminary work in connection with the installation of a Radar at Mohanbari aerodrome has also been taken up. Radar watch on weather was maintained at Calcutta, New Delhi, Bombay, Nagpur, and Madras. A large amount of equipment was received for development and modernisation of observatories and for expansion of departmental workshops and laboratories.

185. About 6,400 'C' type Radio Meteorographs, 5,400 Radiosonde transmitters, 1,500 Rawin transmitters and 500 various other instruments were manufactured at the departmental workshop at New Delhi. About 4,900 'F' type Radio Meteorographs and 200 surface instruments were manufactured at Poona. 9,71,000 cft. of Hydrogen gas was produced at Agra.

186. With a view to improve the performance of different meteorograph elements in the 'C' type radio meteorographs, three compound die and punch sets were designed and adopted. A SWISS high precision sliding head stock Automatic (Bechler-16) was assembled with its feed machine and put into commission for production of Radiosonde components. The work of development and improvement of meteorological and other instruments in use in the department was continued. Attention was also given to ways and means of reducing the production cost of instruments and use of raw materials from indigenous sources wherever possible. Production of fine adjustment valves (till recently imported) for use with hydrogen cylinders was started at the workshop at New Delhi. An automatic electronic Counter for mass calibration of meteorographs was designed. A range finding device using transponder principle to work with rawin transmitter was designed and tested. A helical antenna working on 400 mc/s for the reception of circularly polarised signals was designed and constructed. A proto-type model of baroswitch was developed. A proto-type model of the projector and receiver unit of the ceilometer for measuring cloud height at aerodromes was tested. Experiments to use indigenous chemically treated paper in place of imported electrosensitive paper for facsimile transmission were successfully carried out at Poona.

187. The new workshop building at New Delhi has been completed and plans for construction of a new carpentry and smithy section are under progress. A plot of land measuring 37, 296 sq. ft. was taken over from the Ministry of Defence for extension of the Hydrogen Factory at Agra.

International Geophysical Year and International Geophysical Co-operation

188. Although the International Geophysical Year (IGY) ended on 31st December, 1958, the period of International Geophysical Co-operation was extended for another year under the name "International Geophysical Co-operation", 1959. Consequently, in co-operation with the Indian National Committee of the IGY the intensified observational programme in eight different subjects viz. Meteorology, Geomagnetism, Aurora and Airglow, Ionosphere, Solar Activity, Cosmic Rays Oceanography and Seismology, undertaken during the IGY was maintained at the same level as before during this year. The dissemination of messages of "Alert" and "Special World Intervals" along with the daily solar and geomagnetic observations recorded at the Kodaikanal observatory was also continued.

Terrestrial magnetism, Atmospheric Electricity and Ionosphere, Atmospheric Ozone, Cosmic Rays

189. The activities of the principal Magnetic Observatory at Alibag and of the Magnetic observatory at Kodaikanal were continued. The Field Magnetic Stations at Trivandrum and Annamalainagar, which are located respectively to the north and south of the geomagnetic equator were also continued and gave very useful information. At Alibag and Kodaikanal, besides the normal routine photo-registration of the Horizontal (H) and Vertical (V) components of the earth's magnetic field and the magnetic Declination (D), quickrun records of these elements were obtained on all Regular World Days and during Special World Intervals. Inter-comparison of the magnetic equipment at the two field stations and the primary observatory at Alibag was done at regular intervals.

190. The Soviet anti-magnetic schooner "Zarya" the only one of its kind in the world, while carrying out its geophysical investigations in the Atlantic and Indian Seas as a part of the I.G.Y. programme, visited Bombay port in September, 1959. During the period of its stay in Bombay, the Soviet Scientists compared their instruments with those at the Magnetic Observatory, Alibag. The Schooner had a team of nine scientists aboard besides a crew of about 35. Facilities were given by the U.S.S.R. authorities to Indian Scientists to visit the Ship and a number of Scientists belonging to this Department, the Council of Scientific and Industrial Research, the Survey

of India etc. availed the opportunity of visiting the Ship and discussing matters of technical and scientific interests with the Soviet scientists.

191. Observations of the Surface Atmospheric electrical potential gradient continued to be recorded at Colaba, Calcutta, Poona and New Delhi. Observations of electrical potential gradient and conductivity in the upper air were made at Poona and New Delhi on selected days using balloon technique.

192. Regular recording of the ionosphere and ionospheric field intensity was made at Kodaikanal on a 24 hr. basis. Plotting of ionospheric data for regular world days and Special World Intervals were prepared for supply to World Data Centres. Warnings of anticipated magnetic and ionospheric disturbances were issued whenever necessary to the press and to the various interested institutions using wireless communications. The accurate ionospheric predictions made by Kodaikanal Observatory were highly appreciated by the Radio Corporation of America.

193. Regular observations of atmospheric ozone were made with the Dobson Ozone Spector-photometer at New Delhi and Kodaikanal. Continuous recordings of Cosmic-Rays intensity with a Kolhorster apparatus was continued at Kodaikanal.

Astronomy and Astrophysics

194. Kodaikanal Observatory continued to record observations in the fields of Solar physics, Stellarastronomy and radio-astronomy. The installations of the large (20 cm aperture) Lyot Coro-nagraph, the Lyot Monochromatic Filter (band-pass 0 65A) and the large Solar Telescope (consisting of a coelostat with three fused silica mirrors of 60 cm aperture and two telescope objective of 36-metre and 18-metre focal lengths) and the large spectrograph to work with the solar telescope were completed.

195. The construction of improved 100 mc/s and 60 mc/s receivers for radio-astronomical observations was completed. A third receiver working at 200 mc/s was also constructed during the year.

196. Regular measurements of Earthlight were started with a Danjon Cat's-eye Photometer which was received from Pic-du-Midi Observatory in France in 1958.

Indian Ephemeris and Nautical Almanac Unit

197. The third issue of the Indian Ephemeris and Nautical Almanac relating to the year 1960 was published in March, 1959. The special feature of this publication was that a new time measure viz., the Ephemeris Time was introduced in place of Universal Time so

long used. Printing of the fourth issue of the Indian Ephemeris and Nautical Almanac for the year 1961 is in progress. The publication gives the positions of the Sun, Moon, planets, stars, details relating to eclipses and lot of other astronomical data and also includes a separate section on Indian Calendar giving the timings of Tithi, Nakshatra, Yoga etc. together with a list of all-India festivals and other data required for the compilation of Indian Calendars (Popularly known as Panchangs). Rashtriya Panchangs for 1881 (Saka) were published by the department in 12 languages viz., Bengali, English, Gujarati, Hindi, Kanarese, Malayalam, Marathi, Oriya, Sanskrit, Tamil, Telugu and Urdu. The compilation and preparation of the manuscript of the Rashtriya Panchangs for 1882 (Saka) (1960-61 A.D.) was completed.

198. The work of publication of the English translation of the Marathi book "Bharatiya Jyotisastra' a standard work on ancient Indian Astronomy, by S. B. Dixit was taken over by the Department from the Council of Scientific and Industrial Research and printing of the book is in progress. Monthly star charts were supplied to interested Newspapers in India by the Kodaikanal Observatory till August 1959 after which the work was entrusted to the Nautical Almanac Unit at Calcutta.

Overseas Training Programme

199. Shri Y. P. Rao, Meteorologist, who was deputed to the U.K. in 1958 under the Colombo Plan for training in Synoptic Weather Forecasting, returned to India in March 1959 on completion of his training. Miss A. M. Mani, Meteorologist, proceeded on deputation to the U.S.A. in June, 1959 for training in Meteorological instruments for a period of six months under the Indo-U.S. Technical Co-operation Scheme.

200. Shri P. K. Das, Meteorologist who was under training in the U.S.A, in "Numerical Weather Prediction" was given special leave for a year with effect from September, 1959 for continuing further studies in the same field.

Advisory Committees, Scientific Bodies, Symposia etc.

201. A meeting of the Joint Meteorological Committee was held during the year for effecting coordination between the Meteorological Department and other Government Departments making use of, or concerned with, the meteorological services. The Department was represented on the meetings of the Working Group on Scientific Research and the meeting of the Panel of Scientists of the Planning Commission to formulate the Scientific Policy during the Third Five Year Plan. Officers of the Department also attended a Symposium on "Scientific Instruments" which was held at Dehra Dun under

the auspices of the Defence Science Organisation of the Defence Ministry. The Department was also represented at the meetings of the Central Board of Geophysics, under the Ministry of Scientific Research and Cultural Affairs, the Airport Consultative Committee and the Communications Consultative Committee under the Civil Aviation Department, various River Commissions of the Central Water & Power Commission, Central Board of Irrigation and Power, the Committee of Engineers of the Railway Board, the Committee for Arid Zone Research of the Ministry of Food and Agriculture, the Indian National Committee for I.G.Y. of the Council of Scientific and Industrial Research and panel of Scientists of the Indian Standards Institution for demarcating Seismic zones.

202. The Director General of Observatories was a member of 14 scientific and technical bodies in his official as well as individual capacity. A number of other officers of the department have been members of various scientific and technical Committees convened by the Central and State Governments as well as other interests.

International Collaboration.

203. The Department continued to take an active part in the activities of the World Meteorological Organisation and International Civil Aviation Organisation. At the meeting of the International Civil Aviation Organisation Middle East and Southeast Asia Regional Air Navigation Commission held at Rome from 7th January to 3rd February 1959, India was represented by a delegation of four officers of which Dr. P. Koteswaram, Director, Aviation Services, India Meteorological Department was the Leader. He was also elected Vice Chairman of the Meteorological Committee and Chairman of the Working Group for Meteorological Procedures set up at the above meeting. This meeting drew up a plan for meteorological service to aviation for the Region extending from Italy to Australia during the next 5 years keeping in view the needs of high altitude, high speed jet air craft.

204. The Third Congress of the W.M.O., held at Geneva during April, 1959, was attended by Shri S. Basu, D.G.O. (Leader), Dr. P. R. Pisharoty, Meteorologist at Poona and Dr. S. N. Sen, Director, Regional Meteorological Centre, Calcutta. Shri S. Basu and Dr. P. R. Pisharoty also attended the Commonwealth Meteorologists' Conference held at London during May, 1959. The Congress dealt with the various activities of the W.M.O. for the next 4 years and formulated general directives for adoption by Technical Commissions and Regional Associations. The Commonwealth Meteorologists' Conference took steps to coordinate and intensify research in tropical meteorology as a Cooperative effort in the Commonwealth. India

is represented on the Committee formed to ensure such a Collaboration.

205. A Joint meeting of the Meteorology Division of the ICAO and the Commission for Aeronautical Meteorology of the W.M.O. was held at Montreal (Canada), during September, October, 1959. The meeting was designed to bring upto-date the methods used to supply weather information to aircraft taking into account the special needs of turbo-jet airliners flying at high altitudes. The Indian delegation consisted of Shri P. R. Krishna Rao and Dr. P. Koteswaram The latter was elected as the Chairman of the Technical Committee of the Conference and a member of the Standing Working Group on Area Forecasting. India was elected to another Working Group to which Dr. S. N. Sen is being nominated.

206. The Second Session of the Regional Association for Asia of the W.M.O. was held at Rangoon, Burma, in November, 1959. A delegation consisting of Shri P. R. Krishna Rao, Director General of Observatories (Leader), Shri S. Basu, Director General of Observatories (on leave preparatory to retirement), Shri C. Ramaswamy, Deputy Director General of Observatories (Forecasting) and Dr. S. N. Sen, Director, Regional Meteorological Centre, Calcutta, attended this Session. Shri S. Basu presided over the Session as President of RA-II and resigned the Presidentship towards the end of the Session. Shri P. R. Krishna Rao was elected as Chairman of a Technical Committee of the Conference and at the end of the Session was elected as the Vice President of the Regional Association II until the next session. The Association decided to set up 9 Working Groups for working between sessions and India has been elected to every one of them. Shri C. Ramaswamy was elected as Chairman of the Working Group on Telecommunications.

207. 25 officers of this department have been nominated or elected to serve as expert members of technical commissions and/or Working Groups of the World Meteorological Organisation, the International Union of Geodesy and Geophysics, the International Astronomical Union and the International Atomic Energy Agency.

208. This department co-operated in the organisation of a seminar on Hydrologic networks, which was held at Bangkok in July 1959 under the Joint auspices of the W.M.O. and ECAFE and contributed a Scientific paper to the Seminar. Shri S. Venkataraman, Assistant Meteorologist, Agricultural Meteorology Division attended a symposium on Water relation of Plants in Arid and Semi Arid Zones held at Madrid in September 1959 on invitation from the U.N.E.S.C.O.

209. Dr. A. Ramasastry, Meteorologist in charge of the Marine Section of the Department at Poona, attended a Conference on the

disposal of Radioactive wastes held at Monaco in November, 1959 Mr. Khiou Bonthonn, Chief of the Cambodian Meteorological Service who was deputed to India for training under the Technical Co-operation Mission of the U.S.A. was given a course of training in Agricultural Meteorology from April to June, 1959.

210. Mr. Bernard Frank, Food and Agriculture Organisation Expert on Forest Influences, on assignment with the Government of India, Dr. S. W. Stower, Locust Survey Entomologist of the F.A.O. and Dr. R. Ringoet, Chief of the Division of Botanical Physiology, Belgian Congo, visited the Agricultural Meteorology Division, Poona.

211. Mr. Viaut, President of the W.M.O. and Director, Meteorological Service of France visited the H.Q. Office at New Delhi in October, 1959. Sir Harold Joffrey, a noted geophysicist of the U.K. visited the Department's offices at Delhi and Poona in November, 1959.

Collaboration with and Technical Aid to neighbouring countries

212. The Department continued to collaborate actively with the meteorological service of Afghanistan by loaning instruments and personnel. The Indian Met. team which had been manning the meteorological offices at Kabul and Kandahar was withdrawn after 31st August 1959 with the exception of two Professional Assistants whose further stay was considered essential by the Afghan Met. authorities.

213. A Supplementary Meteorological Office manned by this department continued to function at Kathmandu in Nepal. At the request of the Government of Nepal, action is in progress for establishing a Meteorological Forecasting Office at Gauchar airfield, Kathmandu in order to provide necessary meteorological facilities for aviation in Nepal.

214. Shri S. Mazumdar, Meteorologist Grade I, was deputed on foreign service to take up an appointment in Iraq for one year as an expert under the I.C.A.O. Technical Assistance Bureau.

215. Shri S. K. Gupta, Assistant Meteorologist was placed on foreign service to take up an appointment as a Technical Assistant in the W.M.O. Secretariat at Geneva from August, 1959.

Scientific Publications

216. The proceedings of the Symposium on Meteorological Aspects of Floods and Draughts held at New Delhi in April, 1958 were issued as a publication of the department. Similar publication of the proceedings of the "Monsoons of the World" held under the Joint auspices of the W.M.O. and the India Meteorological Department and the

Indian Meteorological Society as well as the Symposium on Meteorological requirements for jet aircraft are under preparation for issue shortly.

217. "The Indian Journal of Meteorology and Geophysics" was published regularly from the Headquarters Office at New Delhi. The publication of the Kodaikanal Observatory Bulletin, the Annual Volume of the Colaba and Alibag Observatories and other periodical reports namely the Indian Daily Weather Reports, the Monthly Weather Reports and the Indian Weather Review (Annual Summary) was continued.

218. The Department co-operated with the Films Division of the Ministry of Information and Broadcasting in the production of their film on International Geophysical Year.

219. Some exhibits concerning the work done at Astrophysical Observatory Kodaikanal were supplied to the Secretary-General of the Astronomical Exhibition, Japan. The Department also participated in the exhibition arranged during the Symposium on "Scientific Instruments" held at Dehra Dun, by sending a set of meteorological instruments which were highly appreciated by various Scientific bodies.

220. The Department participated in the World Agricultural Fair by putting up a suitable stall which showed the various activities of the Department, particularly in the field of Agricultural Meteorology. Exhibits ranging from simple instruments for agricultural meteorology to the use of radar in weather forecasting for agriculture were explained by trained personnel to a large number of farmers and others who visited the stalls. A number of selected publications of this Department were sent to the Publication Directorate of the C.S.I.R. in connection with the exhibition of Scientific and Technical publications to be held in February, 1960 in Delhi.

221. 5 talks were given on the All India Radio on meteorological subjects by the officers of the Department in English and regional languages. A number of newspaper articles on meteorology were contributed and lectures given at educational institutions.

Investigation and Development

222. 5 Senior Research Scholars under the Research Training Scheme sponsored by the Ministry of Education are being given Research facilities, 4 of them at Kodaikanal Observatory and one in the Investigation & Development Section of the Office of the Deputy Director General of Observatories (Forecasting) Poona. Investigations regarding medium range forecasting techniques are in progress by a Special Research unit at the Meteorological Office, Poona.

223 Among the various problems that have engaged the attention of the Research workers during the year may be mentioned studies of Storms and Depressions in the Arabian Sea, Statistical Models for Describing Weather Persistence, Rainfall intensities for Local Raingauge Design, Radar Studies of thunder Storms and other clouds, Lightning in clouds at temperatures above 0°C, Studies on Jet Streams over India, Studies relating to Agricultural Meteorology, Applications of Magnetohydrodynamics Theory to Ionospheric Problems, Solar Flares, Concurrent Cosmic Ray Bursts and subsequent Geomagnetic storms, Lunar Diurnal Variation of Earth's Magnetic Field, Momentary Bursts of Cosmic Radiation etc 52 papers (including short notes) were published by the officers of this Department during the year in the Indian Journal of Meteorology and other Scientific Journals, including Foreign Journals.

Recreation Clubs:

224 During the year 1958-59, grants-in-aid were given to the recreation clubs functioning in 11 different offices of the India Meteorological Department with a total membership of 1,281. The total amount of grant sanctioned was Rs. 2,186. The recreational activities of the clubs included indoor and outdoor games, literary and cultural activities and provision of magazines, etc. The accounts of the clubs were audited by internal auditors and the heads of the respective offices have been taking keen interest in the working of the clubs and are supervising their activities. The grants-in-aid were properly utilised to the benefit and welfare of the staff of the Department in helping and encouraging them in social and recreational activities.

Budgetary Position

225. The table below shows the budget estimates for 1959-60 and 1960-61:—

	Budget Estimate for 1959-60	R. E. for 1959-60	B. E. for 1960-61
	Rs.	Rs.	Rs.
(*a*) Revenue Demand	1,62,47,000	1,59,56,200	1,76,74,300
(*b*) Capital Equipment	10,93,000	10,03,000	10,26,000
(*c*) Contribution to the W. M. O. . .	80,000	90,000	90,000

SECTION V—OVERSEAS COMMUNICATIONS SERVICES

226. The Overseas Communications Service is responsible for the working of telegraph, telephone and radio-photo services between India and foreign countries.

227. The Chief Administrative head of the Service is the Director General, Overseas Communications Service, with headquarters located at Bombay.

The Service has two main branches, *viz.* Traffic and Engineering. The Traffic branch is under the control of a Deputy Director General (Traffic), and the Engineering Branch is under the control of a Chief Engineer.

228 The Overseas Communications Service has four gateway centres for handling international communications at Bombay, Calcutta, New Delhi and Madras. The Bombay centre has its transmitting station at Kirkee, receiving station at Dhond and the Central Traffic Office at Bombay. The transmitting and receiving Stations as well as the Central Traffic Office are interlinked by land-line V.F. Telegraph system.

229 Calcutta Centre has its transmitting station at Halisahar and receiving station at Hatikanda, about 30 and 36 miles respectively from the Central Traffic Office at Dalhousie Square, Calcutta.

230. The New Delhi centre of the Overseas Communications Service has its new transmitting station at Kalkaji with expanded facilities for external telecommunications by radio-telegraph, radio-telephone and radio-photo services. The station was formally opened on February 6, 1958. The new receiving station at Chattarpur has commenced operating from the 24th January, 1959. The Central Traffic Office is located at the Eastern Court, New Delhi.

231. The Madras centre is so far a sub-marine cable station but it will soon have a radio centre which is being organised with its transmitting station at Korattur and receiving station at Padianellur, connected to the Central Traffic Office in the General Post Office buildings, Madras. As soon as the centre with the station buildings, etc. is ready for operation of wireless circuits, it is proposed to transfer the Indian end of the terminal of the telephone service to

Singapore from Bombay to Madras. It is also proposed to have a direct radio-telegraph service to London from Madras. Madras radio centre is expected to be formally opened by about March, 1960.

232 The following radio telegraph services are now operated by India:—

DIRECT WIRELESS TELEGRAPH SERVICES

(1) Afghanistan.
(2) Australia.
(3) Burma.
(4) China (Shanghai and Peking).
(5) Egypt.
(6) France.
(7) Hanoi.
(8) Indonesia.
(9) Iran.
(10) Italy.
(11) Japan
(12) Poland
(13) Roumania.
(14) Saigon.
(15) Switzerland.
(16) Thailand.
(17) United Kingdom (3 outlets—from Bombay, New Delhi and Calcutta).
(18) Union of Soviet Socialist Republics.
(19) United States of America (2 circuits, via Mackay and via R.C.A.).
(20) West Germany.
(21) Yugoslavia.

233. In addition to these direct services, Overseas Telegraph facilities are provided with all the other countries of the world, via the International sub-marine cable and Radio Telegraph Network with which India is linked. The cable chains are:—

(a) Bombay-Aden-Alexandria-Malta-Gibraltar-London.
(b) Bombay-Aden-Mombasa-Zanzibar-Sychellas.
(c) Madras-Penang-Singapore-East Asia.

234 *DIRECT RADIO-TELEPHONE SERVICES* are available with the following countries:—

(1) Aden.
(2) Australia
(3) Bahrain
(4) Burma.
(5) China
(6) East Africa.
(7) Egypt
(8) Ethiopia
(9) France.
(10) Hongkong.
(11) Indonesia.
(12) Iran.
(13) Italy.
(14) Japan.
(15) Malaya.
(16) Poland.
(17) Saudi Arabia.
(18) South Vietnam.
(19) Switzerland.
(20) United Kingdom (3 outlets via Bombay, New Delhi and Calcutta).
(21) Union of Soviet Socialist Republics.
(22) West Germany.

235. Besides these direct services, Radio Telephone services via the International network are available to other countries, as listed below separately.

236. Special facilities are provided for the exchange of press despatches and other material, over the Radio-Telephone Services, for use by Broadcasting Organisations in various countries.

Conference Call Facilities:

237. Facilities exist for conference calls to be handled between the United Kingdom, the United States of America and India. This facility permits a calling party in India to converse simultaneously with up to 5 telephone subscribers in the United Kingdom or the

United States of America. These calls are popular with users who desire to hold telephonic conferences between parties situated far apart.

Switched Radio-Telephone Services:

238. Radio-telephone Service via International network is available to the following countries:—

(1) Algeria.
(2) Argentina.
(3) Austria
(4) Barbados
(5) Belgium
(6) Bermuda
(7) Brazil
(8) Canada
(9) Ceuta
(10) Chile
(11) Cuba
(12) Czechoslovakia
(13) Costarica
(14) Denmark
(15) Doha
(16) Finland
(17) Frobisher Bay (Canada)
(18) Ghanna
(19) Gibraltar
(20) Goosbay Labrador Canada)
(21) Greece
(22) Gautemala
(23) awaii
(24) onduras
(25) ungary
(26) eland
(27) ish Republic (Eire)
(28) Israel
(29) Kuwait
(30) Lebanon
(31) Luxembourg
(32) Mexico
(33) Morocco
(34) Muscat
(35) Netherlands
(36) Newfoundland.
(37) New Zealand
(38) Nicaragua
(39) Nigeria
(40) Norway
(41) Panama
(42) Rhodesia
(43) Ryukyu Islands
(44) Spain
(45) South Africa
(46) South West Africa
(47) Sudan
(48) Sweden
(49) Tangier
(50) Tunisia
(51) United States of America
(52) Vatican City
(53) Yugoslavia.

239. The following Ships-at-sea make use of the radio telephone service:

America, Atholone Castle, Capetown Castle, Caronia, Constitution. Corinthia, Eastriver, Edinburg Castle, Empress of Britain, Empress of England, Independence, Israel, Ivernia, Maasdam, Nevasa, Nieuw Amsterdam, Olympia-Elir, Orcades, Orion, Oronsay, Orsova, Oxfordshire, Oslofjord, Pedennis Castle, Prestoria Castle, Queen of Bermuda, Queen Elizabeth, Queen Mary, Reina-Del-Mar, Rijndam, Stirling Castle, Saxonia, Sylvania, United States and Zion.

240. **Direct Radio-Photo Services**—are available with the following countries:—

(1) China
(2) France
(3) Italy
(4) Japan (two circuits)
(5) Poland
(6) United Kingdom (and other destinations via London) (three circuits)
(7) United States of America.
(8) Union of Soviet Socialist Republics.
(9) West Germany.

241. **Switched Radio-Photo Services.**—Radio-photo service *via* London is available to the following countries:—

Australia, Belgium, Canada, Czechoslovakia, Denmark, Egypt, Finland, Greece, Germany, Ghanna, Kingston Jamaica, Norway, Portugal, Sweden, South Africa, Switzerland and Yugoslavia.

Multi-Address Press Broadcast:

242. Overseas Communications Service provides multi-address news-transmissions by Radio Telegraph on behalf of the Ministry of External Affairs to the Indian Consular posts abroad. The transmission from New Delhi centre are picked up by the following consular posts:—

Colombo, Kathmandu, Rangoon, Kabul, Singapore, Djakarta, Baghdad, Tehran, Bangkok, Beirut, Ankara, Paris, Cairo, London, Brussels, Rome, Berne, Prague, Moscow, The

period in addition to the existing channel between New Delhi and Bombay A leased cryptographic telegraph channel was made available to the U.S. Authorities in addition to working several telegraph circuits to the U S A., U.K, etc. All overflow of traffic was handled through the Overseas Communications Service Centres at Bombay and Calcutta. The communication facilities provided by the Overseas Communications Service were highly appreciated by the foreign dignitaries and the Press correspondents The traffic handled during the period was very large The Press words, voice-casts and radio pictures transmitted from New Delhi during these visits were more than the figures of traffic handled during the whole of 1958-59.

MODERNIZATION OF SERVICES:

245-A. In pursuance of the provision in the Second Five Year Plan of the Overseas Communications Service for Modernization of Telegraph System, five sets of automatic error detecting and correcting equipment, called "TOR/ARQ" have been installed, four at Bombay C.T.O. and one at Calcutta. The main features of this equipment are that it is designed as a multiplex terminal providing four teleprinter channels of 60 words per minute each and provides what is called a "protected circuit" having been devised for automatic detection and correction of errors occurring on the radio path due to fading or any other cause. The equipment is further capable of being split up into four Sub-channels each having a clearance capacity of 15 words per minute. The installation of this equipment has increased the revenue earning capacity of the Overseas Communications Service as these five terminals have catered for six leased circuit channels with a revenue of about Rs. 13 lakhs per annum to the Overseas Communications Service and additional capacity is available for leasing out more channels from these terminals.

246. **Deputations Abroad.**—(1) Shri H. N. Mukerjee, Chief Engineer, OCS, Bombay was deputed as a Member of the Indian Delegation to attend the meetings of the Working Party of the ECAFE and Plan Sub-Committee of the CCITT held at Tokyo (Japan) during May 1959.

(2) Shri B. S. Dutt, Engineer-in-Charge and Shri S. Sreenivasachar, Dy. Engineer-in-Charge, OCS were sent on deputation to the U.K. for training under the Colombo Plan.

(3) Shri M. S Gharse, Engineer-in-Charge, OCS, H.O Bombay left India on the 30th June, 1959 on deputation to Australia for training under the Colombo Plan. He returned to India on 22nd October, 1959.

(4) Shri H M Mukerjee, Chief Engineer, O.C S, was appointed as India's Representative on the C.T B. and Communications Adviser to the High Commissioner for India in London with effect from the 5th August, 1959.

Budgetary Position.

247. The net profit for 1958-59 amounted to Rs. 43,19,575 as against Rs 43,74,225 in 1957-58. Net profits for the two years are shown below in terms of percentages Decrease in net profit for 1958-59 is mainly due to increase in expenditure

	1958-59	1957-58
Net profit as percentage of Govt. Capital	21 06	23 15
Net profit as percentage of traffic Revenue	24 19	24 43
Net profit as percentage of total Revenue	23 38	23 92

The budget estimates and revised estimates for the year 1959-60 and budget estimates for 1960-61 are as given below.

	Budget estimates for 1959-60	Revised estimates for 1959-60	Budget estimates for 1960-61
	Rs.	Rs.	Rs.
1. Revenue expenditure	1,36,86,000	1,33,76,000	1,34,34,000
2. Capital expenditure	40,00,000	36,40,000	48,93,000

SECTION VI—RAILWAY INSPECTORATE

248. The duties and functions of the Government Inspecto Railways as laid down in Section 4 of the Indian Railways Ac 1890 are as under:

(a) holding of inquiries into serious railway accidents;

(b) inspection of new railway lines prior to their openir passenger traffic;

(c) periodical inspection of non-Government lines;

(d) making recommendations with regard to the rumir new types of block instruments, locomotives and r stock;

(e) giving sanction to the opening for passenger traffic of works, such as deviation lines, bridges, signalling interlocking installations, stations, junctions and ings on the level;

(f) additions, alterations and reconstructions materially a ing the character of works which form part of, o directly connected with the working of Railways al open for the public carriage of passengers;

(g) giving sanction to and the movement of overdimen consignments; and

(h) disposal of applications relating to infringments of ard dimensions.

249. Government Inspectors were formerly under the Ra Board but on the recommendation of the Pacific-Locomotive mittee, which was endorsed by the Centarl Legislature, they transferred from the control of the Railway Board, and the D ment was reorganised as the Railway Inspectorate. It was under the late Communication Department with effect from th May, 1941. The Railway Board, however, still remain the Controlling Authority and contribute a maximum amou Rs. 2,85,000 annually towards the cost of the Inspectorate.

250. There are four Circles of Inspection with headquart Bombay, Calcutta, Bangalore and Lucknow. The Lucknow is, however, for the present located at Calcutta, for want of su accommodation at Lucknow. It is proposed to create a new truction Circle at Calcutta, as a temporary measure, with effect

1st March, 1960, to deal with the increased work connected with the extensive development projects of the Eastern Railway, North Eastern Railway, North-East Frontier Railway, South Eastern Railway and the Indian Railways Electrification. Each Circle is under the charge of a Government Inspector of Railways.

251. The head of the Organisation is the Chief Government Inspector of Railways, who is the Principal Technical Adviser to Government on matters with which the Inspectorate is concerned. He provides technical guidance and directives to all Government Inspectors, lays down the policy in respect of matters relating to the safety of Railways and co-ordinates the work of all Government Inspectors in their dealings with the Railway Board and the Railway Administrations. He also advises the Ministry of Railways (Railway Board) in all matters relating to General and Subsidiary Rules for open lines, safety of construction, operation and maintenance in all departments of Railway working, such as Civil, Mechanical, Electrical and Signal Engineering, etc.

252. During the period from 1st January, 1959 to 31st December, 1959 the Railway Inspectorate carried out investigations into 13 serious passenger train accidents.

253. The following table shows at a glance the Budget and Revised Estimates for 1959-60 and the Budget Estimates, 1960-61, in respect of the Inspectorate:—

	Budget Estimates, 1959-60	Revised Estimates, 1959-60	Budget Estimates, 1960-61
(*a*) Establishment Charges, etc.	3,69,000	3,63,300	4,43,400
(*b*) Railway Boards' maximum contribution towards the cost of the Railway Inspectorate . . .	2,85,000	2,85,000	2,85,000
(*c*) Incidence on General Revenues . . .	84,000	78,300	1,58,400

SECTION VII—INDIAN TELEPHONE INDUSTRIES LTD. BANGALORE

254. The Company continued to make steady progress during the year. There has been an all round increase in production as compared to earlier years, the annual targets for the Second Plan period having been exceeded even during 1958-59. As a result, the Second Plan target of 3,20,000 telephones and 2,15,000 lines, is likely to be exceeded considerably by the end of the Plan period. Simultaneously with the increased production, emphasis is being laid on the acceleration of the pace of development as well as increasing the number of items under development. In particular, emphasis is laid on fuller exploitation of indigenous sources of supply which go into production. The Company has developed a new telephone—new in appearance, size and performance—production of which in large scale will be taken in hand shortly. The Indian Telephone Industries has also taken up, for development and manufacture, a number of items of equipment required for the Railway Electrification project, thereby helping to conserve foreign exchange.

255. The Company is also attaching great importance to integrated and well-co-ordinated research work in respect of existing and new equipment. Towards this end, the Factory's Departments are working in close collaboration with the Tele-communication Research Centre of the P. & T. Department.

Production

256. The production targets and achievements of some main items are given below:—

Items.	Production for 1958-59	Targets for 1959-60	Production during April-Nov. 1959
Telephones.	84,300	92,000	62,405
Exchange Lines	51,325	58,625	34,060
Long distance Transmission Channels . .	424	700	455

257. Targets for the year 1960-61 have been provisionally fixed at 1,20,000 telephones, 70,000 exchange lines and 1,500 Long Distance Transmission Channels.

258. Side by side with increased production, attention is also being paid to reducing the cost of production. For this purpose, work

studies, job simplification and cost rationalisation methods are being undertaken. Incentive schemes for workers have also been introduced. The prices of manufactured equipment have shown a further decrease. For example, the Automatic Telephone instrument sold to the Posts & Telegraphs Department came down further from Rs. 79 during 1958-59 to Rs. 73 approximately. The price for the same instrument during 1953-54 was about Rs. 108.

259. Various turned-precision parts like bolts, nuts, screws etc. have also been manufactured by the I.T.I., for the use of various industries of the country. Over 25 million turned parts were produced upto November, 1959.

Development

260. Some of the newer designs developed and completed are:—

1. 8 Channel carrier telephone system.
2. 3 Channel stackable carrier telephone system.
3. New telephone including a new receiver and a new Dial.
4. Portable magneto telephone.
5. Decade capacitor.
6. Scrambler.
7. 24 Channel equalizer.
8. Resistance capacity oscillator.
9. Auto manual relay sets.
10. Auto-auto relay sets.
11. Call queuing equipment.
12. Watchman's clock facility to work with PAX's.
13. Single Link Operator Dialling Relay sets.
14. Operator's head gear set—with a light receiver and transmitter.
15. Buttinski telephone.
16. Trunk time indicator.
17. Rotating magnet generator.
18. Teleprinter exchange.
19. Night alarm bell for telephone exchange.
20. Tractive armature D.C. line relay for Railways.
21. D.C. neutral track relay for Railways.

22. Tele-signalling and communication equipment for use of Railway control and waystation in the non-electrified areas for overhead working

23 Main control, waystation and associated equipment for Railway Electrification Scheme.

24. Emergency portable telephones for Railways.

25. Polarised relay for Railway token instruments

26. Miscellaneous items such as hand micro telephone for Railways.

27. Sound powered unit for Navy.

28 Emergency control room equipment

29. Road signalling equipment for automatic control of road traffic.

30. Staff locating system.

31. Crossbar PAX.

32 Ear defenders for Air Force.

Production of the above said items will be taken on hand shortly.

261. **Design in Progress.**—1 Voice frequency telegraph equipment.

2. Resistance capacity oscillator 150 Kc|s.

3 Loading coils.

4. Speech plus duplex equipment.

5 4 Channel carrier telephone system.

6 Repeating Coils.

7. Selective level measuring set.

8. Detector amplifier.

9 High tension and low tension power packs.

10. Train wire and block & bell circuit for railway electrification.

11. Filter unit for railway block circuit.

12. Active unit and way side unit for interwire telegraph circuit.

13. 4 wire|2 wire junction equipment.

14. 12-Channel carrier repeaters.

15. 4 wire repeater (transistorised).

16. Signalling regenerative repeater.

17. Leak amplifier.

18. 50 CPS transformer and carrier transformers.

19. Regulated power supply.

20 Insertion loss panel.

21. Decade resistors.

22. High frequency beat frequency oscillator.

23. Loudspeaking telephone.

24 25 Lines RAX all uniselector type.

25. Simplified subscriber's meter

26. Timing circuit for special equipment of institute of mental health.

27 Circuits suitable for 1,000 ohms subscribers loop.

28 Improved type of selector switches.

29 Line concentrator for telephone working.

30 10-way loudspeaker system.

31. Crossbar type rural automatic exchange.

32. Neutral polar relay for Railway.

33 Weather proof Telephone for Navy and Ships.

34. Wall mounted Telephone.

35. Telephone for noisy areas such as generator room etc.

36. New Test Set for the new type of telephone.

37. High frequency rotating generator.

38. Four Way Plug and Jack for P. & T. Department.

39. Announcing machine for Trunk Equipment (Tape replay unit).

40. Mini-Soldering iron for use in ITI.

41. Sound powered head gear set for Navy.

42. Portable field telephone for Auto, CB and Magneto working.

Exchanges installed or maintained and exchanges engineered.

262. The following Private Automatic Exchanges were installed and maintained during the period:

	Installed.	Maintained
BOMBAY	22	145
CALCUTTA	36	121
DELHI	33	72
MADRAS	14	28
BANGALORE	35	85
	140	451

263. The following installation work of Main Automatic Exchanges for the Indian Posts & Telegraphs and Railway Department were undertaken:—

(1) FAIRLIE PLACE . . . 400/600—cut over—8th Aug. 1959.
(2) GARDEN REACH . . . 400/600—cut over—16th Aug. 1959.
(3) KOZHIKODE (P&T) . . 1400/7000—Installation in Progress.
(4) KOZHIKODE (P&T) . . Extension 500 lines—Installation in Progress.

264. During the period total number of 60 exchanges with a capacity of 47,000 lines were engineered for P. & T., Railways and private customers; '7 of 50 Lines' were for export to foreign market (in Ceylon).

Finance and Accounts

265. The authorised Capital of the Company continued to be Rs. 4 crores. The total amount of loans granted to the Company by the Central Government stood at Rs. 87,84,200 at the end of March, 1959. A provision of Rs. 9 lakhs has been made in the current year's budget for grant of loan to the Indian Telephone Industries Ltd. and the Company expects to draw this amount before the end of the financial year.

266. The Company declared a dividend at 2½ per cent to the shareholders for the year 1958-59 as compared to 2 per cent for 1957-58.

267. The gross profit for the year 1958-59 amounted to Rs. 26,22,180; the net profit after taking into account a sum of Rs. 75,402 representing Miscellaneous Receipts, was 26,97,582 as against Rs. 25·80 lakhs for 1957-58. Together with the amount of Rs. 96,419 brought-forward from the previous year, the amount available for appropriations was Rs. 27,94,001. The following appropriations were made out of this sum:—

	Rs.
1. Dividend at 2½%	10,00,000
2. Provision for taxes	15,00,000
3. Capital Reserve	60,000
4. Development Rebate Reserve	1,12,000
5. General Reserve	90,045

leaving a balance of Rs. 31,956 to be carried over to next year.

268. The value of total sales of materials and equipment manufactured and imported, came to Rs. 3,34,48,078 as gainst Rs. 3,08,40,805 for the year 1957-58, which represents an increase of Rs. 26,07,273. But for the manufacturing costs coming down as compared to 1957-58, the increase would have been more substantial.

269. Comparative figures of sales during 1956-57, 1957-58, 1958-59 and estimated sales for 1959-60 are given below:—

(In lakhs of Rupees).

	1956-57	1957-58	1958-59	(Estimated) 1959-60	Budget 1960-61
(1) I.T.I. manufactured	188·85	259·92	309·80	333·01	410·00
(2) Imported	76 89	33·87	18·44	18·59	16·30
(3) Indigenous supplies.	8 69	14·98	6·24	7·54	4·51
TOTAL	274 43	308 77	334·48	359·14	430 81

Buildings and Construction

270. During 1959-60, the first stage of Research Centre, the Stadium building, 889 quarters for staff, the Wood Seasoning Kiln, Road formations in the Township and some extensions to the Canteen buildings were completed. The Second stage of the Hostel building, 150 quarters for staff, Surface drainage, Tarring of roads, School hall cum auditorium, Carpentry shop, Sewage treatment plant, etc. were also taken up for construction.

Welfare Measures

271. A scheme to give bonus for regular attendance for certain categories of employees was introduced. The Wage Incentive Scheme introduced earlier, was revised and made more attractive to workers.

272. The relations of the Company with labour and staff continued to be cordial. Besides the Works Committee, Joint Works Councils and Incentive Committees in each Shop were also introduced. These have 50:50 representation of workers and the Management. The objective of the Joint Works Councils is to enable the employees to bring to the notice of the Management certain types of issues so that more expeditious action may be taken. The Management can also disseminate information, policies etc. to the workers. The Joint Works Councils can discuss and recommend any grievances of groups of workers, working conditions in various shops, safety issues,

problems relating to discipline, welfare, training, medical facilities, etc.

273. **Personnel**

	As on 30-9-58	As on 30-9-59
1. Officers	153	184
2. Supervisory		
(*a*) Technical	517	586
(*b*) Non-Technical	173	193
3. Skilled	1006	1087
4. Semi-skilled	2031	2405
5. Unskilled	180	210
6. Clerical	722	749
7. Others	678	734
TOTAL	5460	6148

Statement showing Scheduled Air Services operated by Air India International and Indian Airlines Corporation as on 1st December, 1959.

Operator	Route	Frequency	Aircraft
Air India International	Bombay-Cairo-Zurich-Dusseldorf-London	1 weekly (Sun.)	Super Constellation
	London-Prague-Rome-Cairo-Bombay	1 weekly (Tues.)	Super Constellation
	Bombay-Delhi-Beirut-Geneva-Paris-London	1 weekly (Mon.)	Super Constellation
	London-Geneva-Beirut-Delhi-Bombay	1 weekly (Wed.)	Super Constellation
	Bombay-Cairo-Rome-Dusseldorf-London	1 weekly (Tues.)	Super Constellation
	London-Dusseldorf-Zurich-Cairo-Bombay	1 weekly (Thurs.)	Super Constellation
	Bombay-Beirut-Rome-Prague-London	1 weekly (Wed.)	Super Constellation
	London-Paris-Rome-Cairo-Bombay	1 weekly (Fri.)	Super Constellation
	Bombay-Cairo-Zurich-Dusseldorf-London.	1 weekly (Thu.)	Super Constellation
	London-Dusseldorf-Geneva-Beirut-Bombay	1 weekly (Sat.)	Super Constellation
	Bombay-Beirut-Geneva-Paris-London	1 weekly (Fri.)	Super Constellation
	London-Paris-Rome-Beirut-Bombay.	1 weekly (Sun.)	Super Constellation
	Bombay-Cairo-Rome-London	1 weekly (Sat.)	Super Constellation
	London-Dusseldorf-Zurich-Cairo-Bombay	1 weekly (Mon.)	Super Constellation
	Bombay-Calcutta-Bangkok-Hongkong-Tokyo	3 weekly (Sun/Tue/Fri.)	Super Constellation
	Tokyo-Hongkong-Bangkok-Calcutta-Bombay	3 weekly (Sat/Mon/Wed.)	Super Constellation
	Bombay-Madras-Singapore-Jakarta-Darwin-Sydney	1 weekly (Mon.)	Super Constellation
	Sydney-Darwin-Jakarta-Singapore-Madras-Bombay.	1 weekly (Wed.)	
	Bombay-Madras-Singapore-Jakarta.	1 weekly (Sat.)	Super Constellation
	Jakarta-Singapore-Madras-Bombay	1 weekly (Sun.)	Super Constellation
	Bombay-Karachi-Aden-Nairobi.	1 weekly (Mon.)	Super Constellation
	Nairobi-Aden-Karachi-Bombay	1 weekly (Sat.)	Super Constellation
	Bombay-Aden-Nairobi	1 weekly (Fri.)	Super Constellation
	Nairobi-Aden-Bombay	1 weekly (Tue.)	Super Constellation

Operator	Route	Frequency	Aircraft
Air India International—*contd.*	Delhi-Tashkent-Moscow	1 weekly (Thu.)	Super Constellation
	Moscow-Tashkent-Delhi	1 weekly (Fri.)	Super Constellation
	Cargo Service		
	Bombay-Calcutta-Delhi-Bahrein-Beirut-Zurich-Dusseldorf-London	1 weekly (Mon.)	Douglas DC-4
	London-Dusseldorf-Zurich-Rome-Beirut-Bahrein-Bombay	1 weekly (Sat.)	Douglas DC-4
Indian Airlines Corporation (Bombay Base)	Madras-Bangalore-Coimbatore-Cochin-Trivandrum-Madurai-Tiruchirapalli-Madras	3 weekly (Mon/Wed/Sat.)	Dakota
	Madras-Bangalore-Coimbatore-Cochin-Trivandurm-Madurai-Madras	4 weekly (Tue./Thu./Fri./Sun.)	Dakota
	Madras-Bangalore-Hyderabad	Daily	Dakota
	Bombay-Bangalore	Daily	Skymaster
	Madras-Nagpur-Delhi (NAMS)	Daily	Do.
	Bombay-Hyderabad-Visakhapatnam	3 weekly (Mon./Wed./Fri.)	Dakota
	Bombay-Hyderabad	4 weekly (Tue./Thu./Sat./Sun.)	Do.
	ombay-Aurangabad	Daily	Do.
	Bombay-Nagpur-Calcutta (NAMS)	Daily	Skymaster
	Bombay-Calcutta	Daily	Viscount
	Bombay-Karachi	2 weekly (Mon./Thu.)	Do.
	Bombay-Keshod-Jamnagar-Bhuj	3 weekly (Tue./Thu /Sat.)	Dakota
	Bombay-Porbandar-Jamnagar-Bhuj	4 weekly (Mon./Wed./Fri./Sun.)	Do.
	Bombay-Bhavnagar-Ahmedabad	Daily	Do.

Operator	Route	Frequency	Aircraft
Indian Airlines Corporation (Bombay Base)—*contd.*	Bombay-Bhavnagar-Rajkot	Daily	Dakota
	Bombay-Ahmedabad	Daily	Do.
	Bombay-Belgaum-Bangalore-Cochin	Daily	Do.
	Bombay-Madras	1 weekly (Sun.)	Viscount
	Bombay-Madras-Colombo	Daily (except Sun.)	Do.
	Bombay-Delhi (Palam)	Daily	Do.
	Bombay-Delhi	4 weekly (Tue./Wed./Fri./Sat.)	Do.
(Calcutta Base)	Calcutta-Gauhati	2 Daily	Dakota
	Calcutta-Gauhati-Tezpur-Jorhat-Lilabari-Mohanbari	Daily	Do.
	Calcutta-Mohanbari	3 weekly (Fri./Sat./Sun.)	Do.
	Calcutta-Mohanbari-Passighat	3 weekly (Mon./Tue./Thu.)	Do.
	*Calcutta-Mohanbari-Along	1 weekly (Wed.)	Do.
	Calcutta-Bagdogra	Daily	Do.
	Calcutta-Agartala (No. IC-241)	5 weekly (Mon/Wed/Thu/Sat/Sun.)	Do.
	Calcutta-Agartala. (No. I-C-243)	Daily	Do.
	Patna-Kathmandu (No. IC-245)	6 weekly (except Sat.)	Do.
	Patna-Kathmandu (No. IC-247)	4 weekly (Tue/Wed/Fri/Sun.)	Do.
	Calcutta-Silchar-Imphal	Daily	Do.

*Mohanbari-Along Sector is operated on a non-scheduled basis.

Operator	Route	Frequency	Aircraft
(Calcutta Base)	Calcutta-Agartala-Khowai-Kamalpur-Kailashahar	2 weekly (Tue/Fri.)	Dakota
	Gauhati-Agartala-Silchar	Daily	Do.
	Calcutta-Bhubaneswar	3 weekly (Mon/Wed/Fri.)	Do.
	Calcutta-Delhi	4 weekly (Tue/Wed/Sat/Sun.)	Viscount
	Calcutta-Madras	Daily (except Sunday)	Do.
	Calcutta-Bombay	3 weekly (Mon/Thu/Fri.)	Do.
	Calcutta-Dacca	Daily	Dakota
	Calcutta-Chittagong	3 weekly (Tue/Thu/Sat.)	Do.
	Calcutta-Rangoon	Daily (except Mon.)	Viscount
(Delhi Base)	Delhi-Calcutta	Daily	Do.
	Delhi-Hyderabad-Madras	Daily	Do.
Indian Airlines Corporation (Delhi Base)	Delhi-Bombay	Daily	Do.
	Delhi-Lucknow-Banaras-Calcutta	3 weekly (Tue/Fri/Sun.)	Dakota
	Delhi-Banaras-Calcutta	4 weekly (Mon/Wed/Thu/Sat.)	Do.
	Delhi-Agra-Lucknow-Banaras-Patna-Calcutta	4 weekly (Mon/Wed/Thu/Sat.)	Do.
	Delhi-Agra-Allahabad-Banaras-Patna-Calcutta	3 weekly (Tue/Fri/Sun.)	Do.
	Delhi-Gwalior-Bhopal-Indore-Bombay	3 weekly (Mon/Wed/Fri.)	Do.
	Delhi-Chandigarh-Pathankot-Jammu-Srinagar	1 weekly (Mon.)	Do.
	Delhi-Amritsar-Pathankot-Jammu-Srinagar	Daily (Except Mon.)	Do.

Operator	Route	Frequency	Aircraft
	Delhi-Lahore	3 weekly (Mon/Wed/Fri.)	Heron
	Delhi-Karachi	2 weekly (Wed/Sun.)	Skymaster
	Delhi-Jaipur	Daily	Heron
	Delhi-Patna (NON-SCHEDULED)	1 weekly (Sun.)	Dakota
	Delhi-Amritsar-Kabul	1 weekly (Mon.)	Do.
	Exclusive Freighter Services		
Indian Airlines Corporation	Calcutta-Gauhati	7 Daily	Dakota
	*Calcutta-Kailashahar	4 weekly (Sun/Tue./Wed/Fri.)	Do.
	*Calcutta-Kamalpur	4 weekly (Mon/Wed/Thu/Sat.)	Do.
	*Calcutta-Khowai	3 weekly (Mon/Thu/Sat.)	Do.
	Calcutta-Agartala	18 daily	Do.
	Calcutta-Silchar-Imphal	3 weekly (Sun/Wed/Thu.)	Do.
	Calcutta-Silchar	Daily	Do.
	Aga tala-Gauhati	5 weekly	Do.
	Calcutta-Bagdogra	2 Daily	Do.
	Calcutta-Gauhati-Mohanbari	1 weekly	Do.
	Calcutta-Rupsi	Daily	Do.

*These three services may at times make a landing at Agartala.

APPENDIX II

List of Aerodromes in India maintained by the Civil Aviation Department as on 31st December, 1959.

Serial No.	Name of Aerodrome	Remarks
I.	International Aerodromes	
	1. Bombay Airport (Santa Cruz)	
	2. Calcutta Airport (Dum Dum)	Jointly used by I.A.F.& D.G.C A.
	3. Delhi Airport (Palam)	
II.	Major Aerodrome.	
	4. Agartala	
	5. Ahmedabad	
	6. Begumpet	
	7. Delhi (Safdarjung)	
	8. Gauhati	
	9. Madras (St. Thomas Mount)	
	10. Nagpur	
	11. Tiruchirappalli	
II.	Intermediate Aerodrome.	
	12. Allahabad	
	13. Amritsar	
	14. Aurangabad	
	15. Baghdogra	
	16. Balurghat	
	17. Banaras	
	18. Baroda	
	19. Belgaum	
	20. Bhavnagar	
	21. Bhopal	
	22. Bhubaneshwar (Cuttack)	
	23. Bhuj	
	24. Bombay (Juhu)	
	25. Chandigarh	
	26. Coimbatore	
	27. Cooch-Behar	
	28. Gaya	
	29. Gorakhpur (Kusmi)	
	30 Indore	
	31. Jaipur	
	32. Junagadh (Keshod)	
	33. Kailashahar	
	34. Kamalpur	

Serial No.	Name of Aerodrome	Remarks
	35. Khowai	
	36. Kumbhirgram	
	37. Lucknow (Amausi)	
	38. Mangalore (Bajpe)	
	39. Mohanbari	
	40. North Lakhimpur (Lilabari)	
	41. Pasighat	
	42. Patna	
	43. Porbandar	
	44. Rajkot	
	45. Rupsi	
	46. Tezpur	
	47. Trivandrum	
	48. Vijayawada	
	49. Visakhapatnam	
IV.	Minor Aerodromes.	
	50. Akola	
	51. Asansol	
	52. Bareilly	
	53. Bilaspur	
	54. Chakulia	
	55. Cuddappah	
	56. Donakonda	
	57. Jhansi	
	58. Jharsuguda	
	59. Jubbulpore	
	60. Kandla	
	61. Kanpur (Civil)	
	62. Khandwa	
	63. Kolhapur	
	64. Kotah	
	65. Lilitpur	
	66. Madura	
	67. Malda	
	68. Manipur Road	
	69. Muzaffarpur (Rewaghat)	
	70. Mysore	
	71. Palanpur (Deesa)	
	72. Panagarh	
	73. Panna	
	74. Raipur	
	75. Rajahmundry	
	76. Ramnad	
	77. Ranchi	
	78. Satna	

Serial No.	Name of Aerodrome	Remarks
79.	Saharanpur	
80.	Shella	
81.	Sholapur	
82.	Tanjore	
83.	Vellore	
84.	Warangal	
85.	Udaipur (Dabok)	

APPENDIX III

Aeronautical communication stations maintained and operated by the Civil Aviation Department as on the 31st December, 1959.

Serial No.	Name of Aerodrome	Remarks
1	Agartala	
2	Ahmedabad	
3	Akola	
4	Allahabad	
5	Amritsar	
6	Asansol	
7	Aurangabad	
8	Bagdogra	
9	Balurghat	
10	Banaras	
11	Bangalore	
12	Baroda	
13	Baruipur	
14	Banihal	
15	Begumpet	
16	Belgaum	
17	Berhampore	
18	Bhatinda	
19	Bhavnagar	
20	Bhopal	
21	Bhubaneswar	
22	Bhuj	
23	Bombay (Santa Cruz & Juhu)	
24	Calcutta	
25	Chakulia	
26	Chandernagore	
27	Chandigarh	
28	Cooch Behar	
29	Cochin (Civil & Navy)	
30	Chimbatore	
31	Delhi (Safdarjung)	
32	Gauhati	
33	Gaya	
34	Gwalior	
35	Imphal	
36	Indore	
37	Jaipur	

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Serial No.	Name of Aerodrome	Remarks
38	Jammu (Civil & I.A.F.)	
39	Jamnagar (Civil & I.A.F.)	
40	Jamshedpur	
41	Jharsuguda	
42	Jodhpur (Civil & I.A.F.)	
43	Jubbulpore	
44	Kailashahar	
45	Kamalpur	
46	Kandla	
47	Kanpur	
48	Kathmandu	
49	Keshod	
50	Khowai	
51	Kotah	
52	Kumbhigram	
53	Lalitpur	
54	Lilabari (North Lakhimpur)	
55	Lucknow	
56	Madras	
57	Madurai	
58	Mangalore	
59	Mandasor	
60	Mohanbari	
61	Nagpur	
62	Pasighat	
63	Pataudi	
64	Pathankot	
65	Patna	
66	Porbandar	
67	Port Blair	
68	Qazi Gund	
69	Raipur	
70	Ranchi	
71	Rajkot	
72	Rupsi	
73	Saharanpur (Sarsawa)	
74	Tezpur	
75	Tiruchirappalli	
76	Trivandrum	
77	Udaipur	
78	Vijayawada	
79	Vishakhapatnam	
80	Warangal.	

APPENDIX IV

Statement showing the recommendations made by the Committee for Selection, training and licensing of Civil Airline Pilots concerning (i) Training of Civil Air Pilots and (ii) Selection of Trainees.

Part I.—Recommendations which do not involve any financial effect and the Government decisions thereon.

Paragraph	Recommendations of the Committee	Decisions of the Government of India
1	2	3
2.3.2.	The C.A.D. have estimated that the total for Commercial Air Pilots during the foreseeble future is not less than 50 per year. For the immediate future, the Flying should be organised for an output of 25 Commercial Pilots annually. After allowing for wastage during training, the number admitted for training should not exceed 30 a year.	The annual intake of the Civil Aviation Air Pilots estimated at 50 is accepted. One half of the requirements should be met from amongst the Indian Air Force pilots and the other half from the pilots trained at the Civil Flying School. Until such time as Air Force personnel are available in adequate numbers the quota of pilots to be trained at Civil Flying School should be suitably increased.
2.6.9 2.1.	The aim of pilot training at Flying School should be : (1) flying training upto the stage of Commercial Pilot's Licence, (2) Ground training in Technical subjects upto a stage required for the issue of Airline Transport Pilot Licence, (3 & 4) training for flying basic twin-engined Aircraft, the Anson and issue of Instrument Rating on this aircraft; (5) training for Flying Radio Telephone Operator licence and training for DC-3 endorsements only in respect of those trainees who may be sponsored by operators other than the nationalised Air Corporations. The whole of this training should be compressed within a period of two years.	Accepted but the Dakota training should be discontinued at the Civil Aviation Training Centre altogether. Operators other than the nationalised Corps. wishing to secure Dakota training for B pilots employed by them should secure it from the Indian Airlines Corporation.
2.6 9.3 1.	The Flying School should be made Vacational Institution and that there should be a Summer vacation from the 15th of May to the 30th of June.	The Flying School and the Engineering School of the Civil Aviation Training Centre should be declared as Vacation Institutions.
2.6.9.4.1.	The Flying School should aim to train pilots for Commercial Pilots licence and their further training for the issue of Senior Commercial and Airline Transport Pilot's Licences can only be carried out in the Airlines.	Accepted.

1	2	3
2.6.9.6.2.	After nationalisation of Private Airlines a stage has arrived in Indian aviation where one need not have same fears of inadequate training as it existed before. It is, therefore, no longer necessary for the Flying School to undertake flying training on Dakota type aircraft.	Accepted.
2.6.9.6.5. 2.6.9.6.6. & 2.6.9.6.7.	The Committee was convinced that Anson aircraft had a definite and useful purpose towards the training of pilots on DC-3 particularly when availability of aircraft and cost of training were also matters of concern. The training on Anson aircraft will give a trainee substantial and valuable experience on general conditions of flying and types of emergencies obtainable on any twin-engined Piston aircraft. Anson should, therefore, be used for twin-engined training at the 'Flying School'.	Accepted.
2.6.9.7.1.	Enough dual training on the Anson aircraft should be given to enable the trainee not only to acquire proficiency in the operation of aircraft abut also to obtain instrument rating on this aircraft. 35 hours of dual training on Anson aircraft will meet the requirements. Some 'solo' experience on this aircraft is also essential.	Accepted.
2.6.9.8.1.	It will be necessary for the Flying School to undertake the conversion of the pilots of non-scheduled operators to DC-3 as they themselves have no proper facilities. If the entire output of the School is undertaken by the I.A.C. there need not be any DC-3 training at the Flying School, but if there is a surplus, the the trainees should be given DC-3 conversion course as well at the School.	Subject to the I.A.C. agreeing to give Dakota training to persons sponsored by the non-scheduled operators, the Dakota training at the Flying School should be discontinued altogether.
2.6.9.8.2.	With increased flying on Anson Aircraft, the amount of flying required for Dakota conversion should be substantially reduced. For an average trainnee 10 hours of dual instructions including the emergency procedures will suffice for his general flying ability. These extra 10 hours training on DC-3 aircraft will be given at the Flying School for the benefit of the pilots sponsored by the non-scheduled operators.	

1	2	3
2.6.9.12.2.	One DC-3 aircraft will suffice for the recommended task of training of non-scheduled operators pilots. The second aircraft available at the C.A.T.C. can be maintained as "standby" and also used for other activities like calibration of Radio Installations etc.	In view of the decision given against paragraphs 2.6.9.8.1.& 2.6.9.8.2. above, it would not be necessary to keep any Dakotas at the C.A.T.C. for training.
2.6.9.15.1.	The existing arrangement for F.R.T.O. licence at the existing Communication School is satisfactory and be continued.	Accepted.
2.6.9.17.	The rejection of the unsuitable pilot trainees will be decided by a Board consisting of (1) Principal (2) Commandant of the Flying School (3) Chief Flying Instructor and (4) Flying Instructor or Chief Ground Instructor. The decision of the Board who would interview the trainee, should be final.	Accepted.
2.7.2.1.	'Procedure Trainer' installed only at one base *viz.*, at Delhi will not fulfil the training requirements of the entire Indian Airlines Corporation. A procedure Trainer may also be installed at Bombay and Calcutta. Since the existing licences are required to be converted to the new licencing pattern within a period of one year the Indian Airlines Corporation's conversion training programme should be compressed within this period. The existing training facilities in respect of Link and Ground Instructors are inadequate and will need considerable augmentation. This may be done within the shortest possible period with a view to implementing the new licence system within a period of one year.	The recommendations of the Committee should be commended to the Air Corporations for implementation.
2.7.2.2.	The strength referred to above should be continued and adopted as a permanent measure in order to ensure continued training and checking for maintenance of a high professional standard for the renewal of these new licences.	Do.
2.7.2.3.	A minimum of 10 hours of local flying training on DC-3 aircraft is sufficient to enable a trainee to obtain proficiency within the limits of safety to enable him to function as a Co-pilot on Dakota aircraft.	Do.

1	2	3
2 7 2 4.	The present practice in IAC of giving 1500 hours of experience as a Co-pilot on D.C. 3 aircraft is considered adequate before a pilot is taken up for commercial training. The existing command training syllabus of the I.A.C. is sufficient, except that that pilots should be given landing and take off practice from the right hand seat and should be proficient to carry out all manoeuvres from the right hand seat also.	The recommendations of the Committee should be commended to the Air Corporation for implimentation.
2.7.2.8.1.	The Co-pilot should be fully proficient for carrying out their duties which includes the ability to take an aircraft to its destination if the Commander were to become a casualty. Approved Co-pilots may be permitted to carry out all the functions of a Commander, provided that the Official Commander on that aircraft has 'Sufficient Command experience' on that type of aircraft that he is seated on the right hand seat of the flight deck and that he is in a position to take over at any critical time in the interest of safety. The D.G.C.A. will lay down what constitutes "sufficient command experience."	Accepted.
2.7.2.9.1.	In addition to what is presently being given, an annual refresher course should be made mandatory on the type of aircraft on which the person exercises Pilot or Co-pilot privileges. The flight refresher should include checks and emergencies-drills of evacuations and survival. The operating limitations of air-frame and Power Plant should also be included in the Ground Training.	To be commended to I.A.C.
2.7.3.2.1.	The Flying School should undertake the type and command endorsement training of the Pilot of non-scheduled operators on Dakota type of aircraft on a direct operating cost basis. The Command checks of these pilots should also be done by the Government Inspector of Flying.	Subject to the I.A.C. agreeing to give Dakota training to persons sponsored by the non-scheduled operators, the Dakota training at the C.A.T.C. should be discontinued altogether. The Command checks of these Pilots will be done by the Government Inspector of Flying.
2.8.1.3.	The present system for issuance Type Rating or Command endorsement should continue until the recommendations with regard to the establishment of the Chief Inspector of Flying and his organisation are implemented.	Accepted.

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2.10.5.	The following definite role of training may be allocated to the flying clubs :— 1. Hobby flying to the extent available under the subsidy scheme (100 hours in the first year and 50 hours in each subsequent year). 2. Training of cadets of the National Cadet Corps to the extent required. 3. Training for obtaining Private Pilot's licence with a view to providing material for recruitment to the Commercial Pilot's Course at the Flying School.	Accepted.
2.12.1.	No system of selection for entry into the flying clubs need be instituted. The only requirement being that the members fulfil the medical fitness standard prescribed for the Private Pilot Licence.	Accepted.
2.12.5.	The present system of permitting Assistant Pilot Inspectors without Instructors Rating to impart instruction in Flying should be discontinued and in their place only Assistant Pilot Instructors holding current Instructors' Rating trained either at Tambaram or at any other place where approved training can be given to them should, in future undertake training of Pilots in the Clubs.	Accepted.
2.12.6.	The Flying Clubs should equip themselves to provide basic knowledge of engines and airframes, elementary navigation and elementary knowledge of Indian Aircraft Rules and Meteorology for qualifying candidates for Private Pilot Licences.	Accepted
2.12.8.	Trainees holding the Student Pilot's Licence should be debarred from exercising any voting in the management of the Flying Clubs until they qualify as Private Pilots.	Accepted.
2.12.9.	The Flying Clubs be required to maintain dossiers giving details of training imparted and progress of each trainee for every flight undertaken in respect of those trainees who aspire to obtain Private Pilots Licences.	Accepted.

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3.4.1.1.	*Flying School.*—For entry to the Flying School the following be adopted: (*a*) *Age limits*—An applicant must be between the ages of 17 and 21 on the date of commencement of the course. *Relaxation of age*—A relaxation of two years in the upper age limit may be made in case a candidate, (*i*) has 20 hours of ' Solo ' flying to his credit, (*ii*)possesses a degree/diploma/licence in engineering or a post-graduate) degree in Physics or Mathematics,(iii belongs to a Scheduled Caste/Tribe. (*b*) *Educational qualifications.*—Higher Secondary or equivalent, with Physics and /or Mathematics.	(*a*) The relaxation of age limit in respect of candidates having flying experience or higher academic qualifications or in respect of persons belonging to Scheduled Caste/Scheduled Tribe/should be accepted. Accepted, but so long as Matriculation continues in some of the Universities the minimum qualification will be Matric with Physics and or Mathematics.
	(*c*) *Initial screening of applications.*—By the Director General of Civil Aviation Secretariat.	
	(*d*) *Intelligence tests*—Through a written examination consisting of (*i*) a paper on simple essay, general knowledge and current affairs and (*ii*) a paper to test mechanical aptitude, simple mathematics and intelligence. The papers will be set by the Selection Board and the written tests will be conducted simultaneously at a number of centres throughout India where machinery exists for invigilation. The answer papers will be evaluated by the Selection Board. The pass and agregate percentages in each paper will be prescribed by the the Director General of Civil Aviation for the above tests.	Accepted.
	(*e*) *Personal qualities test*—Through an interview by a Selection Board at five centres, namely, Delhi, Calcutta, Madras Bombay and Allahabad.	Accepted.
	(*f*) *Medical fitness.*—The medical examination should be undertaken only in respect of those candidates who have been finally approved by the Selection Board and before the candidates are actualy sent to the Flying school The medical standard should be upto the requirements of Airline Transport Pilot's Licence.	Accepted.

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	(g) *Flying aptitude tests.*—Direct entrants to the Flying School or applicants with less than 20 hours solo flying experience shall be tested for flying aptitude at the nearest Indian Air Force testing centre.	Accepted.
	Candidates with 20 or more hours of solo flight time will be tested by a Flying Inspector or a person authorised by the D.G.C.A. to test their flying aptitude.	
	(h) *Composition of Selection Board.*—The Board will consist of representatives of Indian Airlines Corporation, Air India International, Director General of Civil Aviation and the Flying School.	Accepted.
3.5.1.	There is no need to institute any system of selection for entry into the Flying Clubs, the only requirement being that flying members fulfil the medical fitness standard prescribed for the Private Pilot's licence.	Accepted.

Part II—Recommendations which involve direct or indirect Financial effect and the Government Decisions thereon.

para No.	Recommendation of the Committee	Decisions of the Government of India
1	2	3
2.3.1.	The Air Force should not be relied upon wholly to meet the entire demand for commercial air pilots in future. Due weightage should, however, be given to the possibility of obtaining at least a part of the number required from Air Force sources. A Flying school should be established and maintained for the training of at least half the expected demand of commercial air pilots in the years to come. The Indian Air Force should, therefore, be approached for the release of at least 25 Transport Pilots annually.	It is accepted that a Civil Flying School is essential for training at least of half the expected demand of Commercial Air Pilots from year to year.
2.5.7.1.	If the Airline and the Government are able and willing to undertake the responsibility to establish, equip, staff and operate an independent Flying School with financial assistance from the State, the limits of which will have to be negotiated, the Committee strongly recommends that such a course be adopted.	The recommendation of the Committee that the Flying School should be constituted into an independent autonomous body is not accepted. The existing Flying School should continue as a wing of the Civil Aviation Training Centre and an Advisory Board as suggested by the Committee, should be constituted to advise Government on various matters pertaining to the Flying School.
2.5.7.2.	If the foregoing suggestion is found to be impracticable at the present time, the existing Flying School be continued as a wing of the Civil Aviation Training Centre. In that	

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	event an Advisory Board be appointed by Government as contemplated in para. 2.5.4 of the Report.	Instructional staff strength of the Flying School should be: 1 *Chief Flying Instructor* 3 *Senior Flying Instructors and 3 Jr. Flying Instructors.* Since the intake of future trainees is uncertain, the position of the staff strength mentioned above should be reviewed every year.
2.6.9.9.1. 2.6.9.9.2. 2.6.9.9.3.	The Flying Instructional staff strength of the Flying School with an annual intake of 30 trainees should be one Commandant, one Chief Flying Instructor and six Flying Instructors.	
		Services of an Accounts Officer for manning the existing post of Administrative Officer at the C.A.T.C. should be obtained (through the Comptroller and Auditor General of India) on deputation basis.
2.6.9.10.1.	The present arrangements for employing Instructors at the Flying School from the strength of the I.A.C. on deputation, should be discontinued and the Flying School should employ permanent staff.	The Instructional Staff at the Flying School should be recruited from the open market through the U.P.S.C. in preference to obtaining services of the I'A.C. Pilots on secondment basis so that such staff would be on the regular strength of the Civil Aviation Department.
2.6.9.11.1. 2.6.9.11.2.	A scheme for enforcement of a high standard of training be established alongside the training machinery. The Chief Flying Instructor should also be permitted to check the progress of trainees independently. One Flying Inspector should be permanently posted in the Flying School for carrying out checks from time to time on Instructors as well as on the trainees on percentage basis. This Flying Inspecor should be directly responsible to the Director General of Civil Aviation and should submit his reports periodically.	Since the Chief Flying Instructor will perform checking duties also the need for posting a Flying Inspector to the Civil Aviation Training Centre is not accepted.
2.6.9.12.1.	18 light aircraft (HT. 2/Chipmunk) including 4 stand by aircraft will be needed for meeting the requirements. 7 Anson will be required including reserve aircraft.	Accepted.
2.6.9.13.1.	The present allocation of 30 hours on a synthetic flight trainer is far below the requirements. A minimum of 75 hours of training on a synthetic flight trainer will be necessary together with a minimum of 20 hours of instrument flying in actual flight to enable a trainee to obtain sufficient proficiency for instrument rating. A total of 4 synthetic flight trainers will be required and 4 Instructors.	75 hours of training on a synthetic flight trainer be provided to each trainee of the Pilot's course. An additiond 10% training may be provided in individual cases with the personal approval of the Director General of Civil Aviation.
2.6.9.14.1.	For purposes of imparting instruction on Instrument Rating, it will be necessary to modify at least two Anson aircraft with appropriate airborne Radio navigatinal aids.	Accepted.

(1)	(2)	(3)
2.6.9.16.	Within a period of two years which a trainee will spend at the Flying School he should be qualified upto Airline Transport Pilot's licence standard, in the techniral ground subjects. The Syllabii for ground training should be dealt with by the Director General of Civil Aviation in his recommendations in so far as the licensing requirements for Airline Transport and Senior Commercial Pilot's Licences are concerned. The Committee feels that subjects of first aid, fire fighting, survival, practical work in workshop, air traffic control, should be included in the curriculum of the Flying School.	The Director General of Civil Aviation should examine the recommendation in detail and obtain Government's approval, if necessary.
2.7.2.5.	Proficiency of the pilot for type and command endoresement should be checked by Government Inspector of Flying who should himself be qualified on the type of aircraft for which the endorsemet is required to be given. The Inspectors of Flying be authorised to issue a certificate to the candidate if he successfully carries out his checks.	The need for augmentation of the Flying Inspection Cadre was accepted and one additional post of Inspector of Flying would be sanctioned making total strength; 1 Chief Inspector of Flying and 2 Inspectors of Flying.
2.7.2.6.	Any airline pilot should be subjected to a check for proficiency by an Inspector of Flying before he is approved as a check pilot or as Airline Instructor.	
2.7.2.7.1.	The check pilots of the Corporation and the non-scheduled operators approved by the Director General of Civil Aviation should be allowed to carry out local checks for the renewal of licences of the pilots. At least one check every year should be carried out at night. The Inspectors of Flying posted at all the basis shall be made responsible for supervising the checks carried out by the approved check pilots. The Inspectors of Flying should themselves carry out certain percentage of checks.	These officers would be posted at the Head quarters Office of the Director General of Civil Aviation and will under take checking duties in respectof the Pilots of the two Corporations, non-scheduled, operators and Flying Clubs.
2.8.1.	The post of Chief Inspector of Flying should be revived and an organisation under him with at least three Regional Inspectors of Flying be set up. The Regional Inspectors of Flying should be located at Calcutta, Bombay and Madras. They should be full-fidged commanders themselves, with considerable experience on the type of aircraft on which they are going to carry out checks. They should also by trained for carrying out checking duties and assessing proficincy for the issuance of type rating, Command and Check-pilot approval on the aircraft.	

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2.8.1.1.	Two more Inspectors will be required—one for Flying Clubs and one for Flying School, exclusively for use of training and checking programme.	
2.8.1.2.	The Government should offer attractive terms of service for the post of Inspectors of Flying to attract right type of experienced Pilots.	
2.12.2.	The Flying Instructors released by the I.A.F. should primarily be utilised for instructional duties at the Flying School and to augment the Instructors' strength of the Flying Clubs by sending them to the Clubs on deputation. Air Headquarters may be approached to release a definite number of Instructors, say 10 or 12.	The question of release of I.A.F. Instructor is under consideration of the defence Ministry. The question whether the expenditure on such Instructor should not be met by the Clubs, be examined at the proper time.
2.12.3.	All the existing Instructors at the Clubs and future aspirants for Instructors Rating should be sent to the I.A.F. Instructors' Training School at Tambaram under arrangements with the Air-Headquarters.	The expenditure involved in sending the Instructors of Flying Clubs for training at Tambaram should be met by the Flying Clubs themselves.
2.12.7.	The Flying Instructors of the Clubs should be subjected to routine checks once a year and a refresher course once every three years. The machinery for carrying out the routine checks on the Instructors will comprise of the same two Government Inspectors of Flying who will also be deputed for checking for selection of candidates for entry into the Flying School.	The necessity of separate Inspectors of Flying for the Flying Clubs and Flying School is not accepted. The checks on Flying Instructors at Flying Clubs would be carried out by one of the Inspectors of Flying at the Headquarters of the Civil Aviation Department.
2.12.10	The Government may agree to pay Flying Subvention on all aircraft owned by the Clubs or loaned to them by the Government upto 1500 kgs. gross weight provided they are capable of being used for dual instructional purposes.	Accepted.
2.13.3.	The Government may limit initially dual flying at subsidised rates to 20 hours provided that if a pupil is specially qualified or otherwise suited and recommended by the Chief Inspector that he is likely to go solo in the next 5 hours, an additional 5 hours may also be allowed, making a total of 25 hours of dual instruction before a candidate goes solo in such cases.	Accepted.